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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

January 2002

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background field). Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. Only data from the main hours of 00 UTC, 06 UTC, 12UTC and 18 UTC are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.
N.B. The sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction),
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction),
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

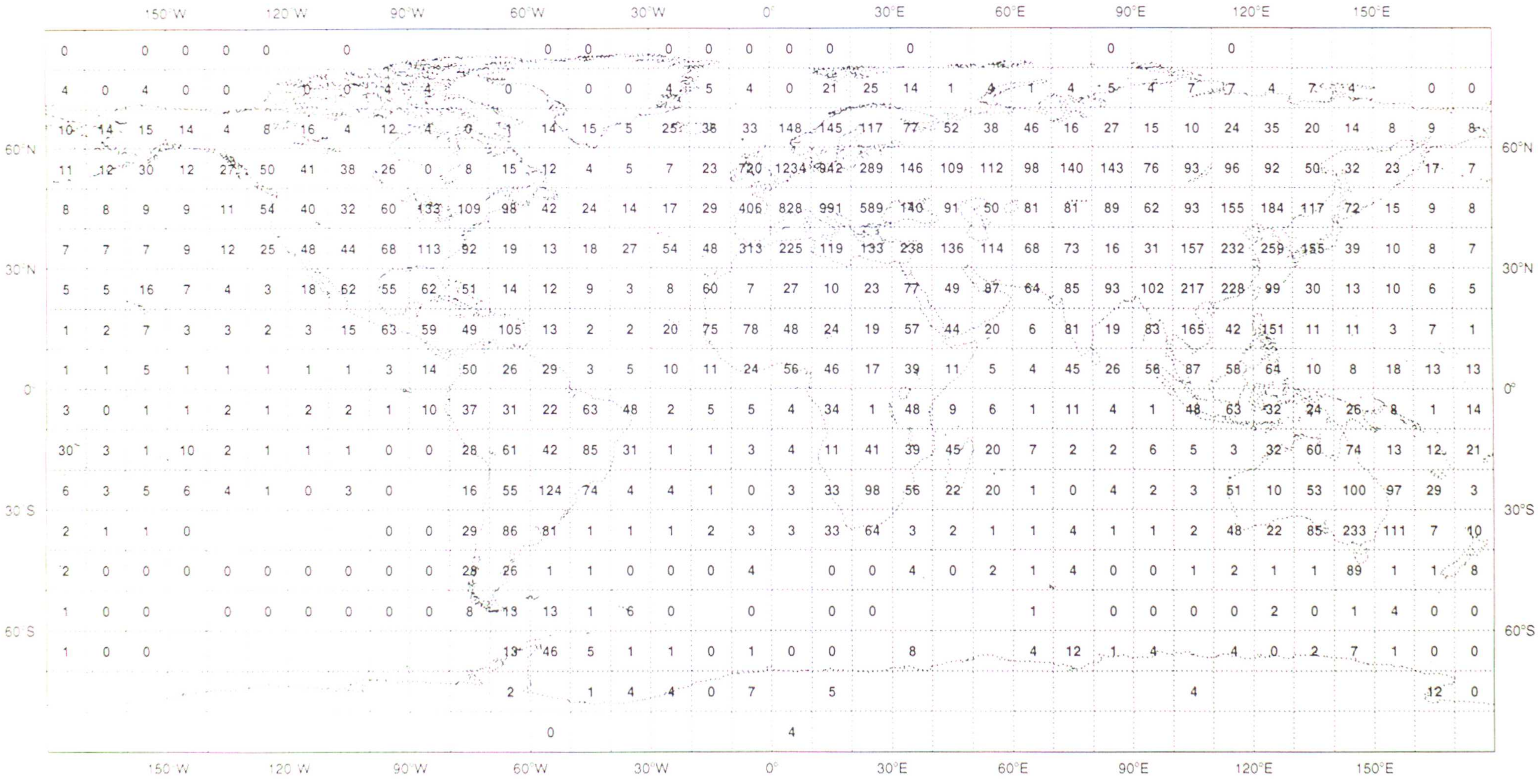
IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
CG2960	ALL	P	SUR	154	47	31	2.5	1.8	3.1
C6LU3	ALL	P	SUR	60	1	2	1.4	7.1	7.3
C6QK	ALL	P	SUR	30	0	0	1.7	5.3	5.6
ELXZ7	ALL	P	SUR	22	0	0	1.1	-4.5	4.7
ELYP8	ALL	P	SUR	39	0	0	1.7	-4.5	4.8
LAOW5	ALL	P	SUR	26	6	23	6.1	9.2	11.0
MVLA7	ALL	P	SUR	29	0	0	2.0	4.5	4.9
P3FZ6	ALL	P	SUR	31	0	0	1.2	6.4	6.6
P3YR5	ALL	P	SUR	56	1	2	1.3	7.1	7.3
UCKB	ALL	P	SUR	35	1	3	1.2	4.0	4.1
UCKC	ALL	P	SUR	21	7	33	0.7	-3.1	3.2
UCUC	ALL	P	SUR	38	1	3	2.4	-4.6	5.2
UDUR	ALL	P	SUR	40	0	0	3.0	-7.1	7.7
UGGA	ALL	P	SUR	36	0	0	1.8	-5.2	5.5
VGDX	ALL	P	SUR	43	0	0	2.2	-4.8	5.3
VRVI2	ALL	P	SUR	50	0	0	1.2	6.2	6.3
V7BW9	ALL	P	SUR	43	0	0	2.1	-5.0	5.4
V7BX3	ALL	P	SUR	48	0	0	0.9	-4.6	4.7
WRYE	ALL	P	SUR	78	0	0	1.1	-5.2	5.3
9MBW	ALL	P	SUR	42	0	0	2.3	-4.0	4.6
WIND SPEED									
C6NI3	ALL	SPEED	SUR	43	1	2	5.1	6.2	8.0
ELWG7	ALL	SPEED	SUR	33	0	0	4.3	5.4	6.9
ELWX5	ALL	SPEED	SUR	298	9	3	5.1	6.8	8.5
ELXT8	ALL	SPEED	SUR	20	0	0	4.5	10.1	11.0
ELZW9	ALL	SPEED	SUR	22	0	0	4.9	5.2	7.1
LAOW5	ALL	SPEED	SUR	27	0	0	3.7	6.6	7.6
OWVI2	ALL	SPEED	SUR	58	1	2	5.6	5.2	7.6
OXRA6	ALL	SPEED	SUR	32	0	0	4.2	5.6	7.0
PHKO	ALL	SPEED	SUR	23	0	0	3.5	6.1	7.1
UCJU	ALL	SPEED	SUR	26	0	0	3.1	5.3	6.1
VCLM	ALL	SPEED	SUR	27	0	0	5.4	7.5	9.3
VLST	ALL	SPEED	SUR	218	0	0	2.7	5.5	6.1
Y3CW	ALL	SPEED	SUR	27	0	0	3.9	-5.7	6.9
ZCBP6	ALL	SPEED	SUR	32	0	0	3.9	5.7	6.9
WIND DIRECTION									
BBXX KS0	ALL	DIRN.	SUR	145	23	16	96.0	50.9	108.7
KS000	ALL	DIRN.	SUR	66	2	3	82.3	-5.1	82.4
KS004	ALL	DIRN.	SUR	74	23	31	82.6	43.3	93.3
KS012	ALL	DIRN.	SUR	47	1	2	85.3	88.8	123.1
KS013	ALL	DIRN.	SUR	56	0	0	94.7	55.7	109.8
32320	ALL	DIRN.	SUR	33	0	0	63.3	69.4	94.0
46061	ALL	DIRN.	SUR	1072	22	2	25.8	-33.3	42.1
51007	ALL	DIRN.	SUR	72	0	0	23.7	36.4	43.5
62131	ALL	DIRN.	SUR	75	0	0	10.2	31.9	33.4
SEA SURFACE TEMPERATURE									
A8AA6	ALL	SST	SUR	34	0	0	2.4	-3.1	3.9
CGDS	ALL	SST	SUR	60	40	67	1.7	-1.3	2.2
CG2960	ALL	SST	SUR	154	58	38	2.1	-1.0	2.3
C6FM7	ALL	SST	SUR	28	0	0	1.9	-3.1	3.7
C6MS4	ALL	SST	SUR	38	0	0	1.4	-3.9	4.1
C6QO9	ALL	SST	SUR	39	0	0	1.2	3.8	4.0
DBBC	ALL	SST	SUR	602	223	37	1.4	1.7	2.2
DBBX	ALL	SST	SUR	663	280	42	0.9	1.1	1.4
DEDI	ALL	SST	SUR	69	46	67	1.2	-0.4	1.2
DGNB	ALL	SST	SUR	715	5	1	3.0	-4.8	5.7

IDENTIFIER	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
SEA SURFACE TEMPERATURE									
ELKU8	ALL	SST	SUR	25	0	0	0.7	4.3	4.4
ELXU5	ALL	SST	SUR	60	0	0	2.3	-3.0	3.8
ELYE8	ALL	SST	SUR	42	9	21	5.4	0.7	5.4
ELZW9	ALL	SST	SUR	23	0	0	0.5	3.0	3.1
H9GW	ALL	SST	SUR	40	0	0	0.8	4.5	4.6
JADY	ALL	SST	SUR	50	0	0	0.7	5.2	5.2
JKHH	ALL	SST	SUR	65	4	6	1.8	5.3	5.6
KRPB	ALL	SST	SUR	54	0	0	1.2	-3.9	4.0
LAJY4	ALL	SST	SUR	61	2	3	1.2	3.3	3.5
LAON4	ALL	SST	SUR	48	0	0	1.5	3.8	4.1
OWEN2	ALL	SST	SUR	26	0	0	3.0	3.0	4.3
PECF	ALL	SST	SUR	51	0	0	1.3	-3.2	3.5
PJOX	ALL	SST	SUR	72	0	0	0.9	-3.7	3.8
P3FV6	ALL	SST	SUR	23	6	26	3.9	-0.5	3.9
SHIPEU	ALL	SST	SUR	23	7	30	0.5	0.5	0.7
S6TY	ALL	SST	SUR	38	0	0	2.5	3.0	3.9
TSMS	ALL	SST	SUR	43	1	2	1.8	-4.5	4.9
UCOL	ALL	SST	SUR	25	4	16	1.3	-3.6	3.9
UCUC	ALL	SST	SUR	39	11	28	2.0	-0.1	2.0
VCLM	ALL	SST	SUR	71	41	58	0.9	1.3	1.6
VGLZ	ALL	SST	SUR	35	35	100			
WGLA	ALL	SST	SUR	73	1	1	2.3	-3.5	4.2
WZJD	ALL	SST	SUR	55	0	0	0.9	-3.2	3.3
23091	ALL	SST	SUR	81	0	0	0.2	-3.9	3.9
27060	ALL	SST	SUR	659	0	0	2.3	3.1	3.9
3ECM7	ALL	SST	SUR	110	0	0	1.5	3.2	3.6
42007	ALL	SST	SUR	716	0	0	1.6	-4.3	4.5
46131	ALL	SST	SUR	714	714	100			
46146	ALL	SST	SUR	712	712	100			
46181	ALL	SST	SUR	712	712	100			
9WCX9	ALL	SST	SUR	36	0	0	1.1	3.0	3.2

Figure 1. SHIP/SYNOP mean daily count. JANUARY 2002

Main hours only

Global average number of observations in 24 hours = 20681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60°N 30°N 0° 30°S 60°S
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10 14 15 14 4 8 16 4 12 4 0 1 14 15 5 25 38 33 148 145 117 77 52 38 46 16 27 15 10 24 35 20 14 8 9 8
11 12 30 12 27 50 41 38 26 0 8 15 12 4 5 7 23 720 1234 942 289 146 109 112 98 140 143 76 93 96 92 50 32 23 17 7
8 8 9 9 11 54 40 32 60 133 109 98 42 24 14 17 29 406 828 991 589 140 91 50 81 81 89 62 93 155 184 117 72 15 9 8
7 7 7 9 12 25 48 44 68 113 92 19 13 18 27 54 48 313 225 119 133 238 136 114 68 73 16 31 157 232 259 155 39 10 8 7
5 5 16 7 4 3 18 62 55 62 51 14 12 9 3 8 60 7 27 10 23 77 49 87 64 85 93 102 217 228 99 30 13 10 6 5
1 2 7 3 3 2 3 15 63 59 49 105 13 2 2 20 75 78 48 24 19 57 44 20 6 81 19 83 165 42 151 11 11 3 7 1
1 1 5 1 1 1 1 1 3 14 50 26 29 3 5 10 11 24 56 46 17 39 11 5 4 45 26 56 87 58 64 10 8 18 13 13
3 0 1 1 2 1 2 2 1 10 37 31 22 63 48 2 5 5 4 34 1 48 9 6 1 11 4 1 48 63 32 24 26 8 1 14
30 3 1 10 2 1 1 1 0 0 28 61 42 85 31 1 1 3 4 11 41 39 45 20 7 2 2 6 5 3 32 60 74 13 12 21
6 3 5 6 4 1 0 3 0 16 55 124 74 4 4 1 0 3 33 98 56 22 20 1 0 4 2 3 51 10 53 100 97 29 3
2 1 1 0 0 0 29 86 81 1 1 1 2 3 3 33 64 3 2 1 1 4 1 1 2 48 22 85 233 111 7 10
2 0 0 0 0 0 0 0 0 0 28 26 1 1 0 0 0 4 0 0 4 0 2 1 4 0 0 1 2 1 1 89 1 1 8
1 0 0 0 0 0 0 0 0 8 13 13 1 6 0 0 0 0 1 0 0 0 0 2 0 1 4 0 0
1 0 0 13 46 5 1 1 0 1 0 0 8 4 12 1 4 4 0 2 7 1 0 0
2 1 4 4 0 7 5 4 12 0
0 4

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :00, 06, 12, 18 UTC

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA : NOBS ≥ 20 , and one or more of the following:

1.|bias|
≥ 4 hPa (pressure).
≥ 5 m s^{-1} (wind speed).
≥ 30 degrees (direction).
≥ 3 degrees (sea surface temperature).

2.SD
≥ 6 hPa (pressure).
≥ 80 degrees (direction).
≥ 5 degrees (sea surface temperature)

3.PGE ≥ 25.

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
25541	81.6	114.9	ALL	P	SUR	740	303	41	6.5	-5.0	8.2
44515	38.0	-71.5	ALL	P	SUR	303	76	25	6.6	-3.6	7.5
44516	39.9	-71.1	ALL	P	SUR	320	106	33	5.4	-3.7	6.5
44517	41.0	-68.5	ALL	P	SUR	320	91	28	5.7	-4.4	7.2
52645	26.5	126.8	ALL	P	SUR	391	0	0	0.8	-5.0	5.0
WIND SPEED											
41523	30.5	-44.7	ALL	SPEED	SUR	35	0	0	4.6	-5.4	7.1
41553	20.8	-66.7	ALL	SPEED	SUR	58	20	34	7.4	14.4	16.2
52529	9.8	157.5	ALL	SPEED	SUR	505	0	0	3.6	-5.1	6.2
52537	15.3	146.6	ALL	SPEED	SUR	582	0	0	2.1	-6.0	6.3
SEA SURFACE TEMPERATURE											
21644	46.5	-167.3	ALL	SST	SUR	206	122	59	0.1	0.0	0.1
22511	13.9	109.4	ALL	SST	SUR	64	0	0	0.4	3.9	3.9
22512	34.7	154.0	ALL	SST	SUR	286	0	0	1.1	3.1	3.3
31913	0.3	-25.1	ALL	SST	SUR	64	0	0	0.2	3.6	3.6
33502	-30.4	-25.1	ALL	SST	SUR	111	0	0	0.7	4.8	4.9
44624	43.9	-42.2	ALL	SST	SUR	1251	0	0	1.5	-3.7	4.0
46972	24.5	-126.2	ALL	SST	SUR	191	0	0	0.5	3.5	3.5
55911	-54.6	-152.1	ALL	SST	SUR	535	0	0	0.8	4.4	4.5
61658	43.9	29.2	ALL	SST	SUR	127	0	0	1.0	5.3	5.4
61659	41.8	35.6	ALL	SST	SUR	47	0	0	1.0	3.1	3.3
64551	61.7	-27.5	ALL	SST	SUR	286	3	1	4.1	-3.5	5.4
65603	65.9	-26.9	ALL	SST	SUR	698	1	0	2.1	3.9	4.4

Figure 2. DRIFTER mean daily count. JANUARY 2002
Main hours only
Global average number of observations in 24 hours = 9475

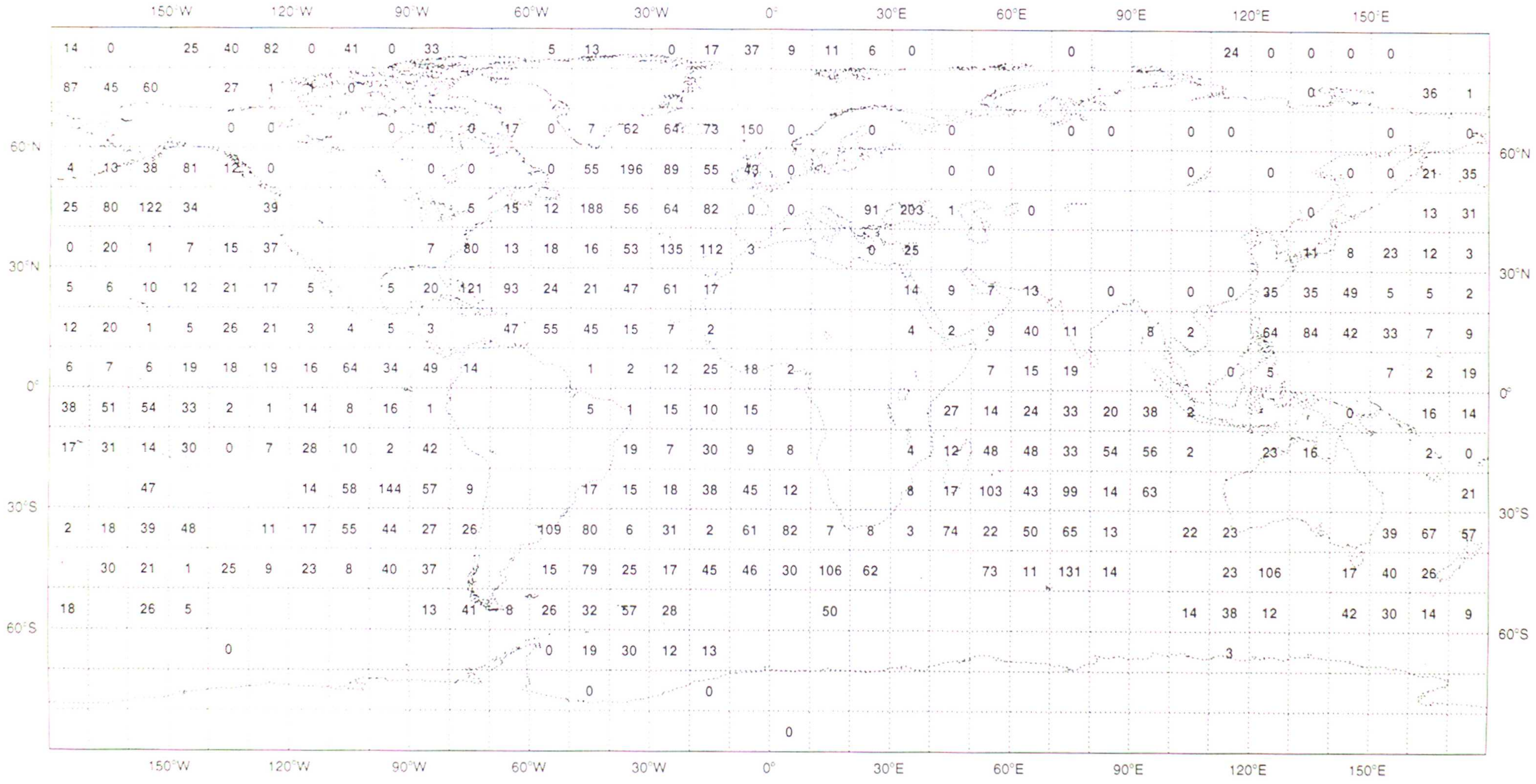

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
14 0 25 40 82 0 41 0 33 5 13 0 17 37 9 11 6 0 0 24 0 0 0 0
87 45 60 27 1 0 0 36 1
0 0 0 0 0 17 0 7 62 64 73 150 0 0 0 0 0 0 0 0 0
4 13 38 81 12 0 0 0 0 55 196 89 55 43 0 0 0 0 0 0 0 21 35
25 80 122 34 39 5 15 12 188 56 64 82 0 0 91 203 1 0 0 13 31
0 20 1 7 15 37 7 80 13 18 16 53 135 112 3 0 25 11 8 23 12 3
5 6 10 12 21 17 5 5 20 121 93 24 21 47 61 17 14 9 7 13 0 0 0 35 35 49 5 5 2
12 20 1 5 26 21 3 4 5 3 47 55 45 15 7 2 4 2 9 40 11 8 2 64 84 42 33 7 9
6 7 6 19 18 19 16 64 34 49 14 1 2 12 25 18 2 7 15 19 0 5 7 2 19
38 51 54 33 2 1 14 8 16 1 5 1 15 10 15 27 14 24 33 20 38 2 0 16 14
17 31 14 30 0 7 28 10 2 42 19 7 30 9 8 4 12 48 48 33 54 56 2 23 16 2 0
47 14 58 144 57 9 17 15 18 38 45 12 8 17 103 43 99 14 63 21
2 18 39 48 11 17 55 44 27 26 109 80 6 31 2 61 82 7 8 3 74 22 50 65 13 22 23 39 67 57
30 21 1 25 9 23 8 40 37 15 79 25 17 45 46 30 106 62 73 11 131 14 23 106 17 40 26
18 26 5 13 41 8 26 32 57 28 50 14 38 12 42 30 14 9
0 0 19 30 12 13 3
0 0
0

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1.|bias|	≥ 4 hPa
	2. SD	≥ 6 hPa
	3.PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60115	34.8N	1.9W	468	M	69	0	0	33	1.6	4.1	4.4
60437	36.3N	2.8E	981	S8	83	0	0	0	0.8	-7.2	7.2
60476	35.4N	7.2E	1116	S8	83	21	25	0	0.6	14.0	14.0
60728	36.4N	10.7E	1	MS	67	0	0	0	0.7	-8.5	8.5
61816	10.9N	14.3W	69	MS	22	6	27	0	0.8	-1.4	1.6
62271	24.2N	23.3E	417	M	76	0	0	0	1.0	4.3	4.4
62790	12.1N	24.9E	674	MS	73	1	1	4	1.7	4.8	5.1
63170	9.5N	44.1E	1326	M	22	0	0	0	1.7	6.9	7.1
63333	11.1N	39.7E	1903	MS	36	1	3	0	0.7	5.6	5.6
63334	10.3N	37.7E	2515	MS	34	0	0	0	0.8	10.8	10.8
63402	7.7N	36.8E	1725	S	36	0	0	0	0.8	8.6	8.6
63450	9.0N	38.8E	2354	MS	33	0	0	0	0.6	4.5	4.5
63471	9.6N	41.9E	1260	MS	35	0	0	0	0.6	11.4	11.4
63478	5.9N	43.6E	295	MS	36	0	0	0	0.6	6.0	6.0
63680	0.3N	32.6E	1144	S	20	0	0	0	0.6	-7.6	7.6
63801	4.9S	29.6E	882	S8	32	2	6	0	1.0	8.7	8.8
65355	9.8N	1.1E	342	MS	104	2	2	0	1.1	-11.9	12.0
68030	18.5S	25.6E	1071	8	81	0	0	0	1.0	4.4	4.5
68038	20.5S	26.0E	903	8	81	0	0	0	1.1	4.5	4.6
68396	26.5S	31.3E	641	S8	56	1	2	2	0.8	5.2	5.3
68575	30.0S	30.0E	1175	S8	105	105	100	0			
68647	31.9S	26.9E	1098	S8	66	0	0	79	1.1	4.9	5.0

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
23383	66.9N	93.5E	278	MS	117	1	1	25	2.6	4.0	4.8
24671	63.9N	135.9E	402	MS	121	3	2	0	4.1	7.1	8.2
24688	63.3N	143.2E	741	MS	122	49	40	0	3.8	4.5	5.9
30554	54.5N	113.6E	995	MS	121	2	2	0	3.8	6.7	7.7
30967	49.9N	115.8E	623	MS	89	0	0	0	2.9	-7.8	8.3
31123	57.8N	130.9E	255	MS	122	3	2	0	3.2	6.0	6.8
36096	51.7N	94.5E	628	M	121	8	7	0	3.5	8.7	9.4
38954	37.5N	71.5E	2077	8	72	5	7	0	3.1	4.5	5.5
40726	36.8N	45.7E	1384	MS	112	0	0	2	2.1	4.4	4.9
40741	36.6N	61.2E	235	MS	102	0	0	0	1.2	-4.6	4.8
40757	35.6N	53.4E	1171	MS	102	0	0	0	1.3	5.3	5.5
41254	23.1N	57.7E	1755	S8	51	51	100	0			
41314	17.7N	54.0E	467	MS	112	0	0	0	0.8	4.1	4.2
41396	16.0N	48.9E	700	MS	53	0	0	0	1.1	7.4	7.5
41466	13.7N	44.1E	1402	8	55	0	0	2	1.0	-5.5	5.6
44212	50.0N	92.1E	940	MS	121	0	0	34	2.6	6.9	7.4
44265	46.1N	91.5E	1186	MS	111	2	2	2	2.1	4.7	5.1
44416	28.6N	81.6E	720	MS	80	3	4	0	2.0	4.3	4.7
47022	40.8N	128.2E	1200	S	84	2	2	2	1.6	5.3	5.5
47127	36.9N	127.0E	16	MS	121	0	0	2	1.1	-12.3	12.3
48920	8.7N	111.9E	3	MS	118	0	0	25	0.8	-4.6	4.7
48947	16.5N	104.7E	155	M	37	1	3	86	0.8	4.2	4.3
51334	44.6N	82.9E	321	M	122	2	2	30	3.1	7.5	8.1
51379	44.0N	89.6E	794	M	122	0	0	1	2.9	7.0	7.6
51495	43.5N	91.6E	874	M	121	37	31	30	2.4	11.1	11.4
51730	40.5N	81.1E	1013	M	122	0	0	0	2.4	4.5	5.1
51818	37.6N	78.3E	1376	M	122	1	1	35	3.0	7.9	8.5
52378	41.4N	102.4E	960	M	122	0	0	0	1.6	5.0	5.2
52602	38.8N	93.4E	2734	S	122	0	0	0	1.8	-5.7	6.0
52866	36.6N	101.8E	2262	S	122	0	0	0	0.7	-4.9	4.9

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
52955	35.6N	100.8E	3201	S	122	0	0	0	0.8	12.5	12.5
53083	44.6N	114.2E	1183	M	122	0	0	32	2.3	4.3	4.9
53352	41.7N	110.4E	1377	M	122	0	0	27	2.4	5.3	5.8
53480	41.0N	113.1E	1416	M	122	0	0	12	2.3	4.4	5.0
53502	39.8N	105.8E	1033	M	122	0	0	28	1.8	4.1	4.5
53705	37.5N	105.7E	1185	M	122	0	0	1	1.8	4.6	4.9
54308	41.2N	116.6E	661	M	122	0	0	2	2.1	4.2	4.7
54386	41.4N	128.2E	1018	M	122	0	0	21	3.0	5.2	6.0
56144	31.8N	98.6E	3184	S	122	0	0	0	1.3	-5.2	5.4
56146	31.6N	100.0E	339	S	122	122	100	0			
56385	29.5N	103.3E	3049	S	122	0	0	0	1.8	-4.7	5.0
56444	28.5N	98.9E	3488	S	122	69	57	48	0.6	13.9	13.9
56462	29.0N	101.5E	2994	S	122	0	0	0	1.7	8.7	8.9
57006	34.6N	105.8E	1143	M	121	0	0	0	2.2	4.6	5.1
59007	24.1N	105.1E	1251	M	122	0	0	1	2.1	4.1	4.6

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
82181	2.0S	54.1W	146	MS	76	0	0	0	1.5	5.2	5.4
83235	12.4S	46.4W	604	MS	69	0	0	3	1.7	6.6	6.8
83332	14.1S	46.4W	826	MS	69	17	25	0	1.8	13.3	13.4
83531	18.6S	46.5W	940	MS	90	0	0	0	1.0	-6.9	7.0
83836	25.5S	50.6W	837	MS	72	0	0	0	0.7	-5.2	5.2
84377	3.8S	73.3W	125	MS	111	0	0	0	1.4	4.5	4.7
84425	5.9S	76.1W	179	MS	80	0	0	1	1.7	4.5	4.8
84455	6.5S	76.4W	281	MS	83	0	0	0	1.3	7.1	7.2
84472	7.1S	78.5W	2620	S	52	0	0	0	0.7	-5.6	5.6
84474	7.2S	76.7W	350	S	24	0	0	0	1.1	10.5	10.6
84686	13.6S	72.0W	3248	S	109	1	1	0	1.0	-4.1	4.2
84688	13.7S	73.4W	3444	S	50	1	2	0	0.7	-12.7	12.7
84720	14.9S	75.0W	567	MS	56	0	0	0	0.8	4.8	4.9
84782	18.1S	70.3W	468	MS	90	0	0	0	1.3	7.2	7.3
85140	14.3S	67.4W	140	MS	58	2	3	5	2.0	5.9	6.2
85141	14.5S	67.6W	204	MS	56	0	0	0	1.8	4.7	5.0
85264	18.5S	64.1W	1998	S	56	56	100	0			
85312	19.8S	63.9W	992	S	47	0	0	0	1.3	-10.1	10.2
85365	21.9S	63.7W	645	MS	58	1	2	2	1.7	4.0	4.3
85432	22.5S	68.9W	2320	S8	83	0	0	0	0.7	5.8	5.8
86065	22.7S	61.5W	220	M	60	0	0	2	2.1	4.6	5.1
88986	59.4S	27.3W	78	S	198	198	100	27			

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71021	61.3N	124.5W	283	MS	118	0	0	11	3.1	4.4	5.4
71023	65.9N	89.5W	18	MS	122	122	100	0			
71177	57.1N	61.5W	834	MS	119	0	0	0	1.7	-4.0	4.3
71506	66.9N	136.3W	720	MS	122	0	0	5	1.6	-4.6	4.9
71747	48.8N	91.6W	424	MS	122	0	0	0	0.8	4.2	4.3
76118	30.4N	109.7W	1040	MS	28	0	0	0	0.7	-11.2	11.2
76243	28.7N	100.5W	250	MS	95	0	0	2	1.5	4.8	5.0
76491	23.8N	99.1W	355	MS	105	0	0	1	1.4	4.5	4.7
76543	22.0N	98.8W	104	MS	46	0	0	0	1.3	8.3	8.4
76625	20.6N	100.4W	1813	MS	64	0	0	2	1.0	-8.7	8.8

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
76658	19.2N	103.7W	494	MS	46	1	2	0	0.7	5.3	5.3
76743	18.0N	92.9W	10	MS	88	0	0	0	0.7	6.0	6.0
76855	15.7N	96.5W	43	MS	62	0	0	2	1.5	-4.6	4.8
76903	14.9N	92.3W	118	MS	114	0	0	0	0.6	6.1	6.1

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
91848	21.9S	158.0W	41	M	90	0	0	52	6.4	-0.9	6.5
92010	6.1S	145.4E	1587	M	41	0	0	0	0.5	10.3	10.3
95815	35.1S	144.0E	72	MS	122	0	0	0	2.3	7.2	7.6
96881	7.6S	111.5E	110	M	29	1	3	0	5.4	4.6	7.1
97378	10.7S	123.1E	1	MS	50	50	100	0			
98232	18.4N	121.6E	2	M	115	0	0	33	3.5	-4.2	5.5

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
06605	47.1N	7.1E	1599	S8	121	0	0	5	1.2	-4.8	4.9
06685	47.0N	9.1E	515	MS	121	0	0	10	1.1	8.1	8.2
06716	46.2N	7.3E	737	S8	121	0	0	0	1.1	4.8	4.9
06786	46.9N	9.5E	555	MS	122	0	0	10	1.5	4.3	4.6
10557	50.5N	11.1E	845	S8	366	366	100	0			
11116	47.5N	10.8E	870	S	60	0	0	0	0.8	4.7	4.8
11141	47.4N	13.2E	543	MS	87	0	0	0	1.5	4.3	4.6
12140	54.4N	18.7E	2	MS	117	0	0	1	0.8	8.0	8.0
12510	50.7N	15.7E	1603	S8	119	0	0	6	1.5	-4.4	4.6
13269	44.3N	19.9E	176	MS	122	0	0	0	1.1	9.2	9.3
13289	44.1N	21.9E	1037	M	100	0	0	77	2.5	-4.2	4.9
13369	43.3N	20.0E	1038	8	99	0	0	8	1.5	-4.2	4.5
14554	44.9N	18.4E	140	S	59	2	3	0	0.9	-13.1	13.1
14650	43.8N	18.0E	972	S	60	0	0	0	0.7	5.1	5.1
16450	37.6N	14.3E	940	S8	35	0	0	6	1.4	-4.0	4.2
17085	40.6N	35.8E	412	M	121	1	1	34	3.0	4.0	5.0
17092	39.8N	39.5E	1218	S8	121	0	0	0	2.1	10.7	10.9
17203	38.9N	40.5E	1177	S8	121	0	0	0	1.4	9.3	9.4

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	75	0	0	0	1.3	-5.1	5.3
89253	63.2S	55.4W	75	M	198	0	0	1	1.5	4.2	4.5
89263	66.0S	66.1W	20	M	205	6	3	2	1.8	9.2	9.4
89264	71.4S	68.9W	780	S	201	2	1	0	0.8	8.5	8.5
89266	72.2S	60.3W	91	S	252	244	97	0	0.3	-14.6	14.6
89272	74.8S	71.5W	1369	S	252	252	100	0			
89327	73.2S	127.1W	230	S	244	80	33	5	3.7	3.0	4.8
89612	66.3S	110.8E	390	S	245	245	100	0			
89637	69.9S	130.0E	2560	S	306	178	58	15	1.1	13.7	13.7
89661	73.1S	169.6E	200	S	75	0	0	0	2.1	6.9	7.2
89666	76.7S	163.0E	200	S	71	71	100	0			
89744	74.0S	43.0E	3353	S	268	0	0	0	0.6	7.0	7.0
89769	78.5S	168.4E	50	S	383	383	100	0			
89847	67.6S	146.0E	30	S	314	0	0	0	1.1	-7.2	7.3

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	1812	0	40	1.8	0.3	1799	0	40	0	8.2	1.2
AAL	5573	1	32	1.8	0.1	5556	0	32	0	8.2	0.7
AAR	1358	1	8	2.0	-0.8	1359	0	7	0	8.4	0.4
ACA	3125	1	10	1.8	-0.3	3135	1	10	0	8.0	0.8
ACI	48	0	48	1.0	0.4	48	0	50	0	9.6	3.2
AEA	869	0	4	1.9	0.5	842	0	5	0	7.7	0.7
AEL	651	1	7	1.9	-0.6	652	0	7	0	7.7	0.5
AEY	248	2	6	2.4	1.5	246	0	4	0	7.8	0.3
AFL	585	1	5	1.8	0.5	579	0	5	0	7.9	0.7
AFR	1762	1	7	1.8	0.4	1770	0	7	0	8.4	0.5
AIH	368	0	4	1.7	-0.1	366	0	6	0	9.0	1.1
AJM	197	1	3	1.5	0.1	200	0	3	0	7.5	1.5
AMM	101	0	10	1.5	0.6	103	0	16	0	12.6	-0.5
AMT	650	0	43	2.9	1.8	650	0	41	0	8.5	0.8
AMX	302	1	4	1.9	0.1	299	0	7	0	11.9	0.4
ANA	621	1	12	1.7	0.5	626	0	12	0	8.1	0.4
ANZ	4947	0	30	1.4	0.4	4931	0	31	0	6.7	0.6
ARG	21	14	48	4.5	2.4	21	0	33	0	16.3	-1.9
AVA	280	1	5	2.0	0.6	283	0	3	0	7.2	0.5
AVE	221	2	8	2.5	1.1	220	0	6	0	9.4	2.0
AVN	121	0	46	0.7	0.2	123	0	46	0	4.9	0.2
AZA	612	3	10	2.4	0.5	602	0	4	0	8.0	1.0
BAL	298	0	12	2.0	0.0	291	0	13	0	9.3	0.5
BAW	806	0	8	2.0	-0.5	809	0	8	0	7.0	0.5
BLX	29	0	0	1.2	-0.2	31	0	0	0	7.1	0.1
BSK	23	4	22	1.2	-0.5	23	0	22	0	6.4	1.3
BWA	318	0	3	2.1	1.5	317	0	5	0	8.7	0.7
CAL	114	0	4	1.8	-0.1	119	1	9	0	10.1	-0.3
CCA	235	3	19	2.6	0.4	251	2	100	0	13.3	0.1
CES	325	1	8	1.8	0.3	332	1	10	0	10.5	0.8
CFG	1005	1	4	1.5	-0.5	990	0	4	0	7.2	0.5
CHH	29	0	17	1.4	-0.2	29	0	24	0	15.3	6.0
CKS	228	1	43	2.4	1.5	227	0	44	0	9.0	2.2
CLX	396	1	2	1.6	-0.5	404	0	1	0	6.4	0.3
CMI	41	0	10	1.1	0.2	42	0	10	0	5.3	-0.5
COA	849	0	44	1.5	0.0	857	0	44	0	7.7	0.6
CPA	38	0	11	1.8	1.1	40	5	20	0	10.7	0.0
CRL	888	1	6	1.7	0.6	888	0	7	0	8.2	0.9
CSN	95	1	6	2.0	0.5	96	1	9	0	10.8	1.6
CUB	253	0	5	2.3	1.3	252	0	5	0	9.3	1.0
DAL	2452	1	38	1.7	0.1	2464	0	38	0	8.1	0.8
DCE	207	2	7	1.5	0.7	206	0	7	0	7.4	0.6
DLH	1461	1	11	1.6	0.1	1449	0	11	0	7.1	0.9
EDW	110	0	4	1.8	0.0	109	0	4	0	8.0	0.1
EEZ	128	1	6	1.7	0.9	126	0	9	0	7.9	0.9
EIA	398	0	11	1.8	0.2	408	0	100	0	16.2	4.3
ELY	108	0	0	1.4	-0.4	111	0	1	0	5.9	1.0
EVA	161	1	7	1.7	-0.2	168	1	10	0	8.8	0.1
EWW	137	0	4	1.6	-0.1	140	0	4	0	8.7	2.1
FDX	2015	0	41	1.6	0.2	2036	0	42	0	8.1	0.9
FIN	254	0	4	1.7	0.0	246	0	5	0	7.5	0.8
FJI	885	2	48	1.3	0.4	859	1	49	0	9.1	1.3
FOM	680	0	29	1.3	0.2	680	0	29	0	6.7	0.7
GCO	156	1	12	1.9	-0.1	164	1	100	0	16.6	3.3
GHA	57	4	7	1.9	-0.5	56	2	11	0	14.3	1.0
GRL	31	0	0	1.5	-0.4	31	0	0	0	6.4	0.5
GTI	279	1	11	1.8	-0.1	284	0	12	0	8.5	1.3
HAL	3712	1	36	1.7	0.1	3685	0	37	0	10.8	1.3
IBE	3048	1	7	1.9	0.4	3001	0	7	0	8.4	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
ICE	745	0	4	1.6	-0.2	728	0	5	0	7.0	0.5
IRL	34	0	6	2.0	1.3	36	0	8	0	8.2	-0.5
IWD	51	0	2	1.5	-0.2	51	0	2	0	7.4	1.4
JAA	121	5	12	2.2	1.1	121	1	8	0	12.1	1.7
JAL	2483	0	6	1.8	0.2	2475	0	6	0	7.8	0.7
JAZ	984	1	5	2.1	1.0	994	0	5	0	7.4	0.8
JKK	149	3	7	1.3	0.1	125	0	7	0	9.6	0.1
JMC	43	0	2	1.6	0.4	41	0	5	0	8.7	-0.5
KAI	22	0	50	3.1	-0.1	30	0	50	0	12.7	-0.3
KAL	2822	0	13	1.8	-0.1	2836	0	14	0	8.2	0.5
KLM	2308	0	4	1.8	0.2	2316	0	5	0	7.6	0.7
LAN	100	5	100	2.2	1.1	105	0	100	0	12.7	2.0
LAP	81	4	43	1.6	0.5	79	0	42	0	9.3	1.0
LDA	106	0	3	1.2	0.4	107	0	5	0	8.2	0.4
LDI	640	2	66	4.1	1.3	642	1	6	0	8.4	0.4
LIB	1214	1	9	1.6	0.8	1228	0	9	0	8.4	0.8
LOT	112	2	9	1.9	-0.9	115	2	9	0	7.7	-0.1
LTU	844	0	5	1.6	-0.1	835	0	6	0	8.9	0.6
MAS	297	1	11	2.0	-0.2	312	0	11	0	9.8	0.6
MON	123	0	2	1.8	-0.1	122	0	2	0	8.0	-0.2
MPD	248	2	6	1.6	-0.4	244	0	8	0	10.0	0.1
MPH	636	0	3	1.8	-0.8	644	0	3	0	7.2	0.5
NCA	636	0	5	2.0	0.3	626	0	5	0	7.8	0.6
NWA	8325	0	9	1.7	0.2	8365	0	10	0	8.1	0.4
NZL	2728	0	13	1.2	0.3	2728	0	13	0	5.3	0.3
OAE	121	0	36	1.3	0.0	121	0	38	0	8.9	0.3
PAC	362	1	28	2.0	-0.4	361	0	27	0	7.9	1.0
PAL	1334	1	13	1.8	-0.3	1286	0	13	0	8.6	0.6
PAO	409	0	55	1.6	0.0	396	2	57	0	9.1	0.6
PUA	31	3	42	2.9	0.9	31	0	39	0	12.2	1.2
QFA	3206	0	46	1.5	0.5	3196	0	46	0	6.0	0.5
RAM	51	2	25	3.5	-0.1	51	4	25	0	18.0	-1.3
RCH	506	1	100	3.0	-0.4	509	0	100	0	14.0	1.6
RJA	26	0	4	2.1	-0.5	25	0	4	0	7.0	1.4
RON	36	0	44	1.6	0.3	37	0	51	0	18.6	2.0
RRR	28	4	14	1.9	-0.3	28	0	11	0	10.9	-2.6
RYN	178	1	42	1.7	1.1	178	1	44	0	9.5	0.2
RZO	212	0	59	3.0	0.5	212	1	8	0	10.6	2.2
SAA	324	1	6	1.7	-0.2	320	0	5	0	7.6	0.4
SIA	306	0	4	1.6	0.3	310	0	4	0	6.9	0.1
SLR	230	0	8	1.6	0.5	239	0	10	0	8.1	0.6
SQC	47	0	2	1.7	1.3	47	0	4	0	6.3	0.6
SVA	31	0	0	1.4	-0.4	32	0	3	0	7.2	0.6
TAG	31	0	35	2.6	-0.2	33	0	30	0	7.3	0.1
TAM	64	6	30	2.3	1.2	67	0	100	0	11.0	0.1
TAP	643	0	5	1.7	-0.1	644	1	6	0	8.3	1.1
THA	134	0	4	1.8	-0.2	136	0	6	0	7.2	0.4
THT	40	0	38	1.5	0.8	40	0	38	0	8.7	0.8
TPA	53	0	0	1.1	0.4	53	0	0	0	6.1	-0.1
TSC	31	0	0	1.4	-0.2	32	0	3	0	11.8	1.4
UAL	153457	0	100	1.4	-0.1	153255	0	100	0	5.4	0.7
UPS	1771	0	53	1.6	0.1	1759	0	53	0	7.9	0.5
USA	198	1	2	1.7	-0.1	173	0	3	0	8.1	0.3
VIR	504	0	3	1.6	-0.1	513	0	5	0	7.9	0.7
VKG	37	0	11	1.6	-0.8	37	0	8	0	5.3	0.8
VPB	35	3	3	1.5	0.8	34	0	3	0	8.5	1.0
VRG	212	3	100	2.5	1.2	213	1	100	0	12.6	0.2
VVJ	29	3	28	2.8	-2.0	31	0	23	0	8.8	0.7
VVR	68	1	35	2.7	-0.4	68	1	34	0	8.8	1.1

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
WOA	233	0	6	1.6	0.2	243	1	12	0	9.8	1.3
YSS	44	0	9	2.7	1.0	44	0	5	0	9.2	0.2
AU	40196	0	11	1.3	0.6	40205	0	11	0	5.4	0.5
EU	124801	0	34	1.3	0.2	124801	0	33	0	4.8	0.5
KL	2135	0	9	1.4	0.8	2138	0	9	0	5.8	0.9
LH	3152	0	10	1.5	0.8	3125	0	10	0	5.1	0.9
MK	5499	0	8	1.9	1.6	5480	0	8	0	7.2	1.6
SA	8462	3	64	2.2	1.8	8444	0	11	0	8.2	0.7
TN	116	2	25	1.7	0.0	114	0	25	0	11.2	1.5
WA	316	3	10	1.4	0.3	311	3	12	0	10.3	0.2
XX	4626	1	9	1.5	0.2	4614	0	10	0	9.9	1.3
N	875	1	32	2.6	0.2	920	0	31	0	9.8	1.1
US ACARS	795889	1	57	1.5	0.4	795881	0	57	0	5.6	0.9

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:1000.0 – 300.1 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS		:10.0 °C ; 60 m s^{-1} Vector Wind
SELECTION CRITERIA		:N REP ≥ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE					WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	1130	1	27	1.4	0.0	1127	0	28	0	8.5	-0.2
AAR	20	0	15	1.3	-0.7	21	0	19	0	7.6	-0.5
AFR	68	0	13	2.3	0.4	69	0	17	0	11.0	-0.7
ANZ	166	3	25	1.7	0.1	165	0	24	0	7.4	1.8
CFC	128	0	16	1.5	0.6	131	0	18	0	8.9	0.8
CFG	42	0	14	1.7	-0.3	43	0	14	0	5.8	0.2
CLX	22	0	5	2.5	-1.2	24	0	8	0	14.9	3.1
COA	82	0	45	1.4	-0.1	84	0	45	0	7.3	-0.4
CRL	24	0	0	1.7	1.0	24	0	4	0	12.0	0.8
CUB	39	0	10	2.8	1.1	39	0	8	0	9.1	0.7
DAL	379	1	50	1.5	0.3	380	0	50	0	7.3	0.0
DHL	44	0	66	6.1	-5.4	44	0	5	0	9.7	2.1
DLH	114	1	14	1.7	0.3	113	0	14	0	6.8	0.5
EVA	21	5	38	1.2	-0.5	21	5	43	0	8.9	1.0
FDX	345	0	34	1.5	0.5	353	0	35	0	9.8	0.5
FIN	22	5	9	1.7	0.1	22	0	0	0	8.2	3.2
FRE	56	7	14	3.3	0.0	37	0	14	0	13.7	0.3
GCO	343	0	5	1.6	0.0	349	0	100	0	16.8	3.8
GHA	44	9	18	1.4	-0.4	44	0	16	0	14.0	-0.4
GTI	37	0	8	2.9	-1.3	35	0	6	0	9.7	0.3
HAL	127	2	31	1.9	0.5	125	0	30	0	9.5	0.5
IBE	81	4	10	1.8	0.0	79	1	5	0	7.9	0.0
ICE	66	0	3	1.5	-0.2	66	2	3	0	5.8	0.8
JAA	24	0	4	1.4	0.2	25	0	12	0	10.4	1.9
JAL	101	0	10	1.8	0.6	103	1	11	0	8.4	0.2
JAZ	125	0	9	2.3	1.1	126	1	7	0	7.5	1.0
KAL	36	6	33	2.7	-0.7	36	0	25	0	6.9	1.0
KIW	73	7	34	3.9	2.1	76	0	26	0	8.4	0.7
KLM	34	3	3	1.6	-0.2	33	0	6	0	10.2	2.4
LAN	124	4	100	2.6	0.7	143	0	100	0	7.6	2.8
LIB	29	0	3	1.6	1.3	31	0	6	0	7.5	3.5
MAS	34	0	26	1.7	-0.6	32	0	25	0	7.2	2.2
MPH	23	0	0	2.2	0.0	24	0	4	0	9.4	-0.2
NCA	71	0	1	1.6	0.6	69	1	6	0	8.7	-0.1
NWA	364	2	20	1.9	0.6	367	1	20	0	9.6	0.8
NZL	15034	0	56	1.3	0.4	15031	0	56	0	4.4	0.3
PAC	40	0	23	1.5	-0.9	41	0	24	0	9.7	-0.7
PAL	46	0	0	1.2	-0.8	47	0	0	0	6.7	1.0
QFA	288	1	43	1.4	0.3	292	0	41	0	5.9	1.0
RCH	146	2	100	3.0	-0.4	145	0	100	0	12.9	0.9
RRR	56	16	20	1.6	0.5	58	0	9	0	8.7	0.6
SAA	41	0	7	1.7	-0.5	41	0	5	0	6.2	-0.3
SIA	47	0	2	1.0	0.3	49	0	2	0	5.3	0.8
SKI	57	16	42	5.0	-2.4	32	3	13	0	9.8	1.5
UAL	282269	0	100	1.2	0.0	281685	0	100	0	4.7	0.2
UPS	189	0	54	1.3	0.2	188	1	53	0	8.3	-0.5
VTA	25	0	12	2.0	-1.1	26	0	8	0	4.0	1.7
VVP	52	2	56	4.9	3.8	51	0	41	0	9.5	1.7
VVR	31	3	45	3.8	-0.5	28	0	25	0	5.7	-0.3
AU	35704	0	52	1.2	0.2	35705	0	52	0	4.1	0.3
EU	617957	0	71	1.1	0.2	615802	0	71	0	4.0	0.0
KL	1985	0	52	1.2	0.7	1979	0	51	0	4.0	0.5
LH	1167	0	63	1.5	0.2	1154	0	63	0	4.2	0.5
MK	3831	0	56	1.4	0.7	3819	0	56	0	5.3	1.2
SA	6352	3	81	1.7	0.6	6338	0	58	0	5.7	0.7
WA	90	3	12	1.2	0.4	86	3	14	0	5.4	1.2
XX	1480	4	10	1.5	0.2	1473	1	12	0	11.4	1.9
N	38	18	47	4.5	2.3	41	0	24	0	8.4	1.0
US ACARS	1638399	0	79	1.3	0.4	1631741	0	79	0	4.6	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 39474

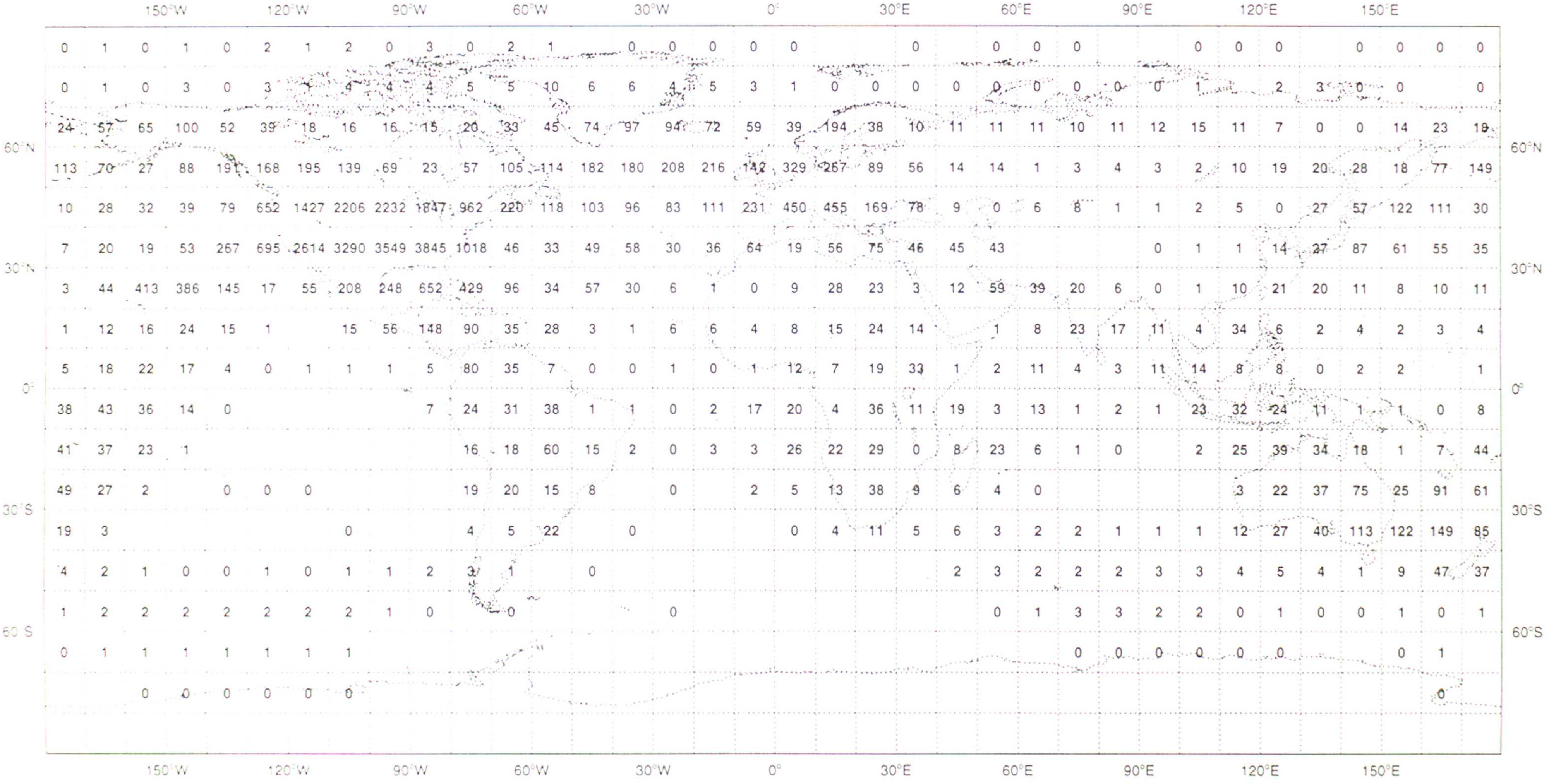

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 2 1 2 0 3 0 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 1 0 3 0 3 1 4 4 4 5 5 10 6 6 4 5 3 1 0 0 0 0 0 0 0 0 0 1 2 3 0 0 0
24 57 65 100 52 39 18 16 16 15 20 33 45 74 97 94 72 59 39 194 38 10 11 11 11 10 11 12 15 11 7 0 0 14 23 18
113 70 27 88 191 168 195 139 69 23 57 105 114 182 180 208 216 142 329 267 89 56 14 14 1 3 4 3 2 10 19 20 28 18 77 149
10 28 32 39 79 652 1427 2206 2232 1847 962 220 118 103 96 83 111 231 450 455 169 78 9 0 6 8 1 1 2 5 0 27 57 122 111 30
7 20 19 53 267 695 2614 3290 3549 3845 1018 46 33 49 58 30 36 64 19 56 75 46 45 43 0 1 1 14 27 87 61 55 35
3 44 413 386 145 17 55 208 248 652 429 96 34 57 30 6 1 0 9 28 23 3 12 59 39 20 6 0 1 10 21 20 11 8 10 11
1 12 16 24 15 1 15 56 148 90 35 28 3 1 6 6 4 8 15 24 14 1 8 23 17 11 4 34 6 2 4 2 3 4
5 18 22 17 4 0 1 1 1 5 80 35 7 0 0 1 0 1 12 7 19 33 1 2 11 4 3 11 14 8 8 0 2 2 1
38 43 36 14 0 7 24 31 38 1 1 0 2 17 20 4 36 11 19 3 13 1 2 1 23 32 24 11 1 1 0 8
41 37 23 1 16 18 60 15 2 0 3 3 26 22 29 0 8 23 6 1 0 2 25 39 34 18 1 7 44
49 27 2 0 0 0 19 20 15 8 0 2 5 13 38 9 6 4 0 3 22 37 75 25 91 61
19 3 0 4 5 22 0 0 4 11 5 6 3 2 2 1 1 1 12 27 40 113 122 149 85
4 2 1 0 0 1 0 1 1 2 3 1 0 2 3 2 2 2 3 3 4 5 4 1 9 47 37
1 2 2 2 2 2 2 2 1 0 0 0 0 1 3 3 2 2 0 1 0 0 1 0 1
0 1 1 1 1 1 1 1 0 0 0 0 0 0 0 1
0 0 0 0 0 0 0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 83889

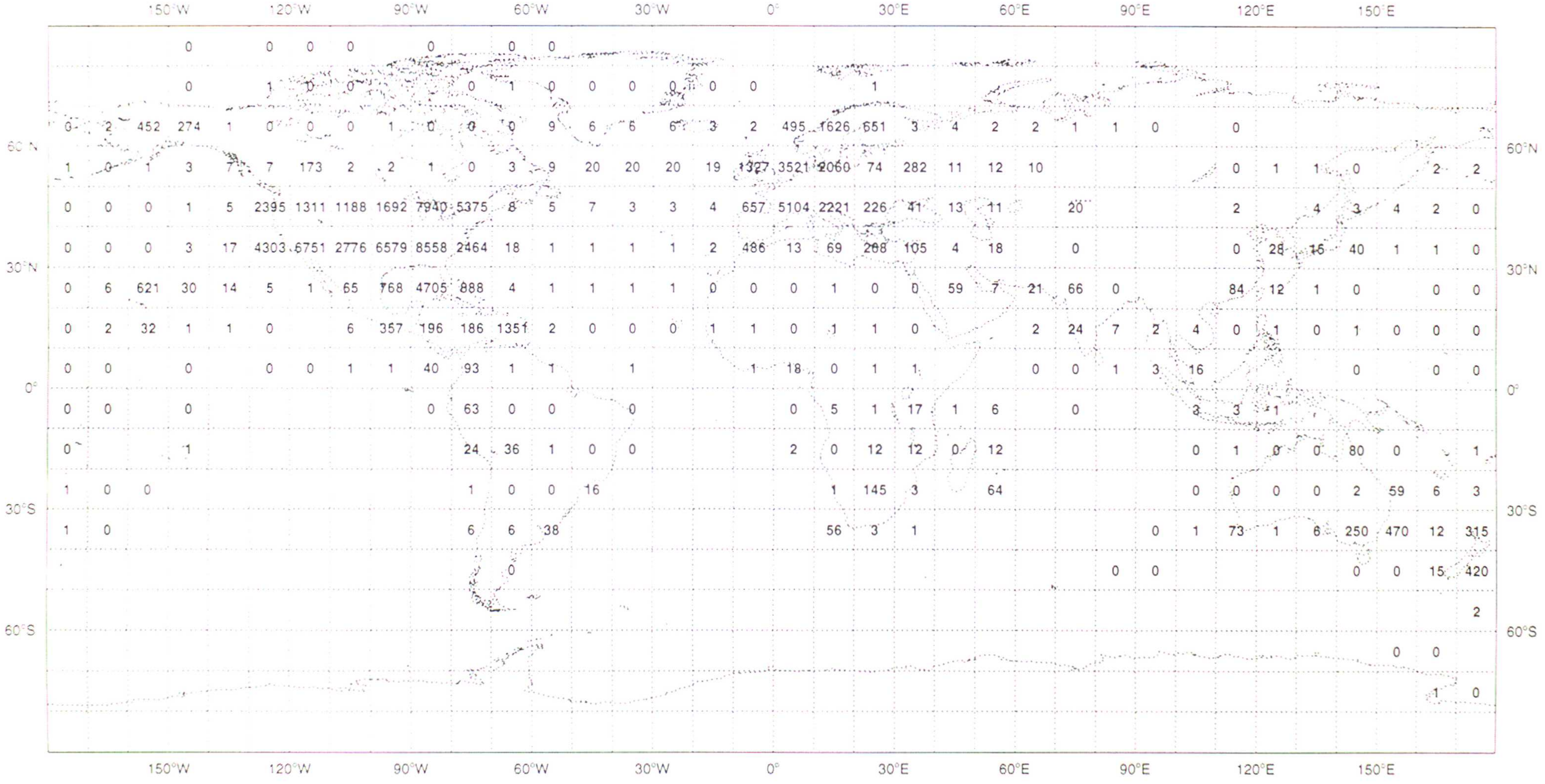

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0
0 1 0 0 0 1 0 0 0 0 0 0 1
0 2 452 274 1 0 0 0 1 0 0 0 9 6 6 6 3 2 495 1626 651 3 4 2 2 1 1 0 0
1 0 1 3 7 7 173 2 2 1 0 3 9 20 20 20 19 1327 3521 2060 74 282 11 12 10 0 1 1 0 2 2
0 0 0 1 5 2395 1311 1188 1692 7940 5375 8 5 7 3 3 4 657 5104 2221 226 41 13 11 20 2 4 3 4 2 0
0 0 0 3 17 4303 6751 2776 6579 8558 2464 18 1 1 1 1 2 486 13 69 268 105 4 18 0 0 28 15 40 1 1 0
0 6 621 30 14 5 1 65 768 4705 888 4 1 1 1 1 0 0 0 1 0 0 59 7 21 66 0 84 12 1 0 0 0
0 2 32 1 1 0 6 357 196 186 1351 2 0 0 0 1 1 0 1 1 0 2 24 7 2 4 0 1 0 1 0 0 0
0 0 0 0 0 1 1 40 93 1 1 1 1 18 0 1 1 0 0 1 3 16 0 0 0
0 0 0 0 63 0 0 0 0 5 1 17 1 6 0 3 3 1
0 1 24 36 1 0 0 2 0 12 12 0 12 0 1 0 0 80 0 1
1 0 0 1 0 0 16 1 145 3 64 0 0 0 0 2 59 6 3
1 0 6 6 38 56 3 1 0 1 73 1 6 250 470 12 315
0 0 0 0 0 15 420
2
0 0
1 0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

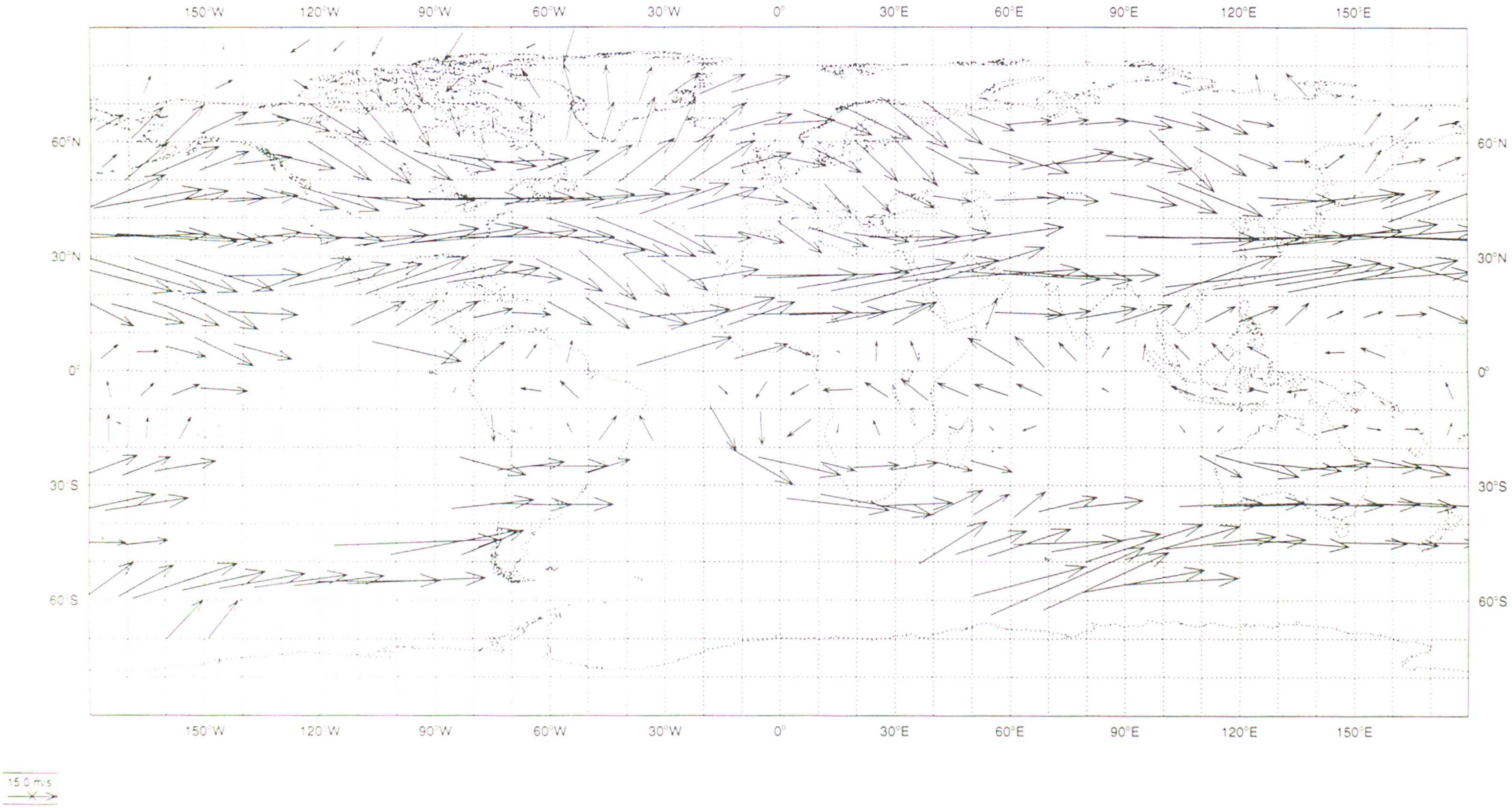

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

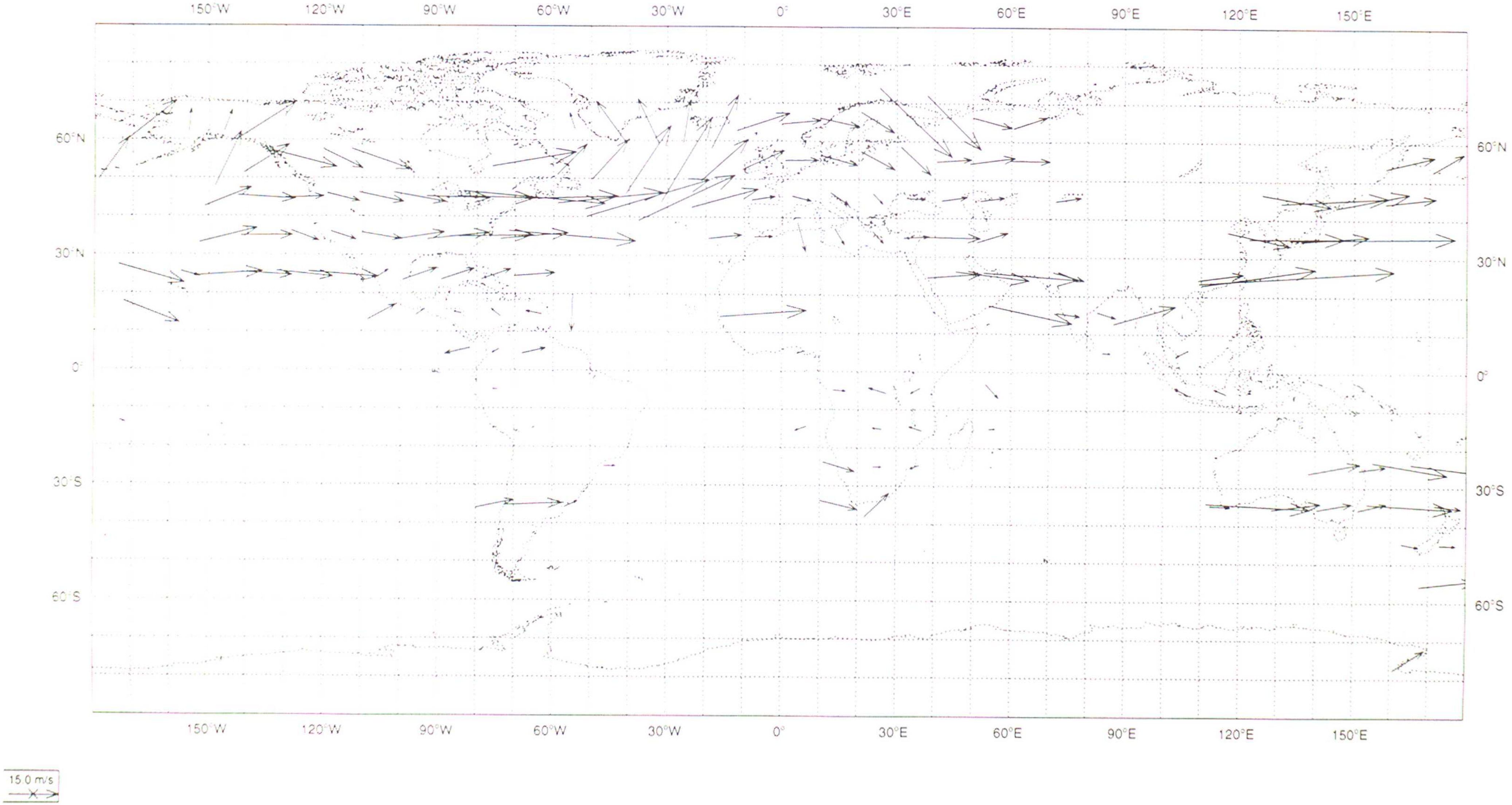

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

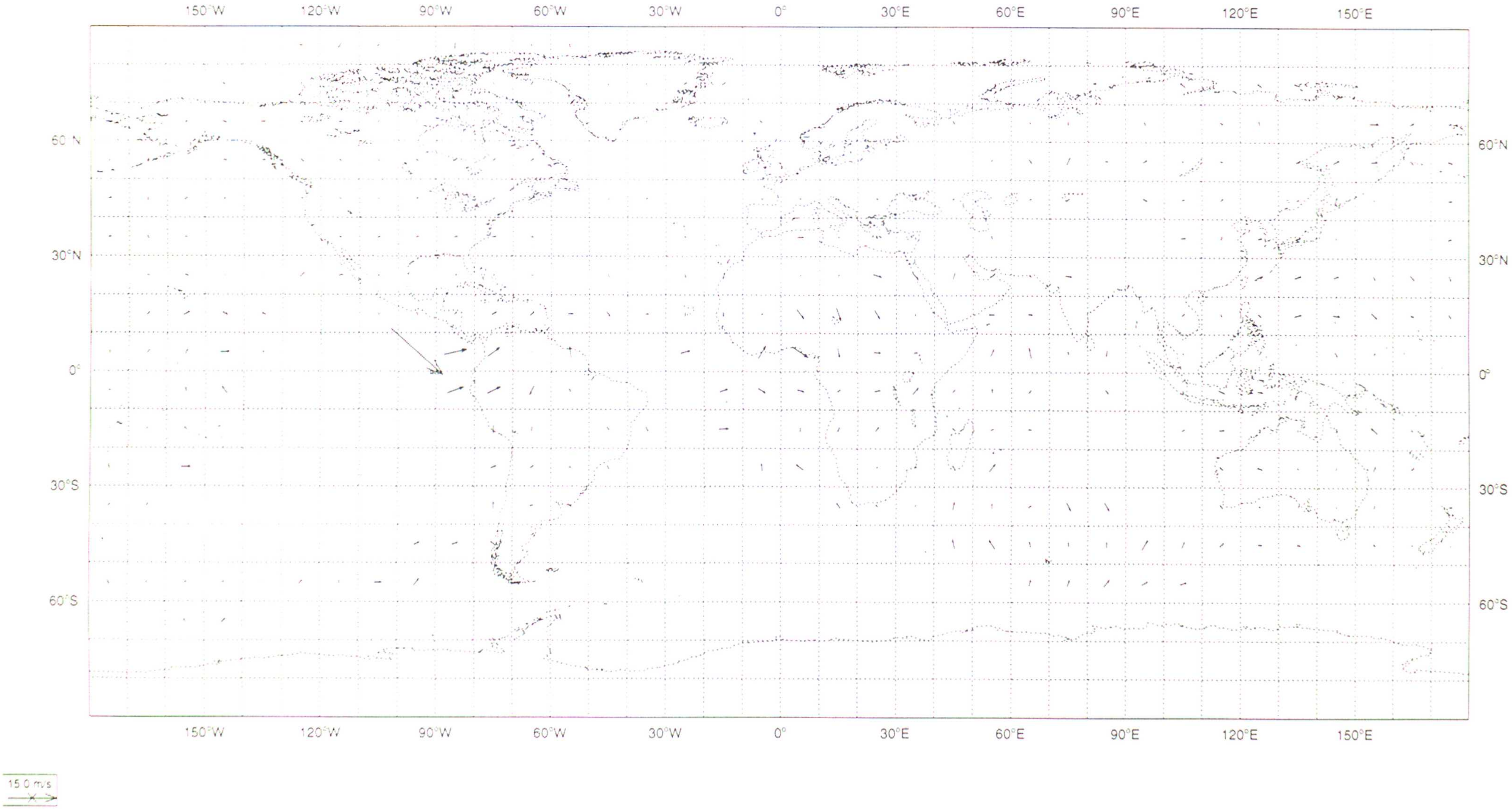

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

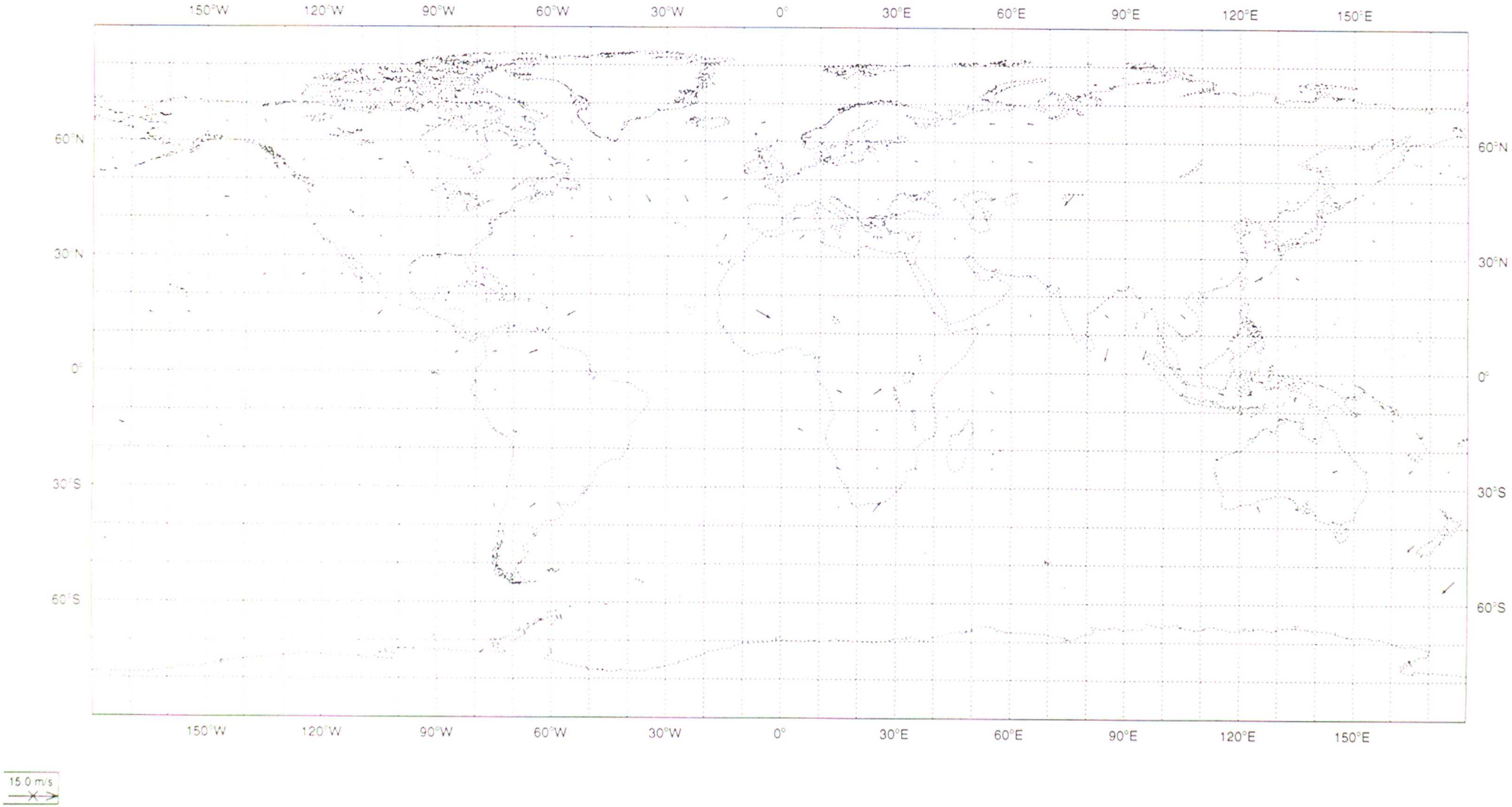

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

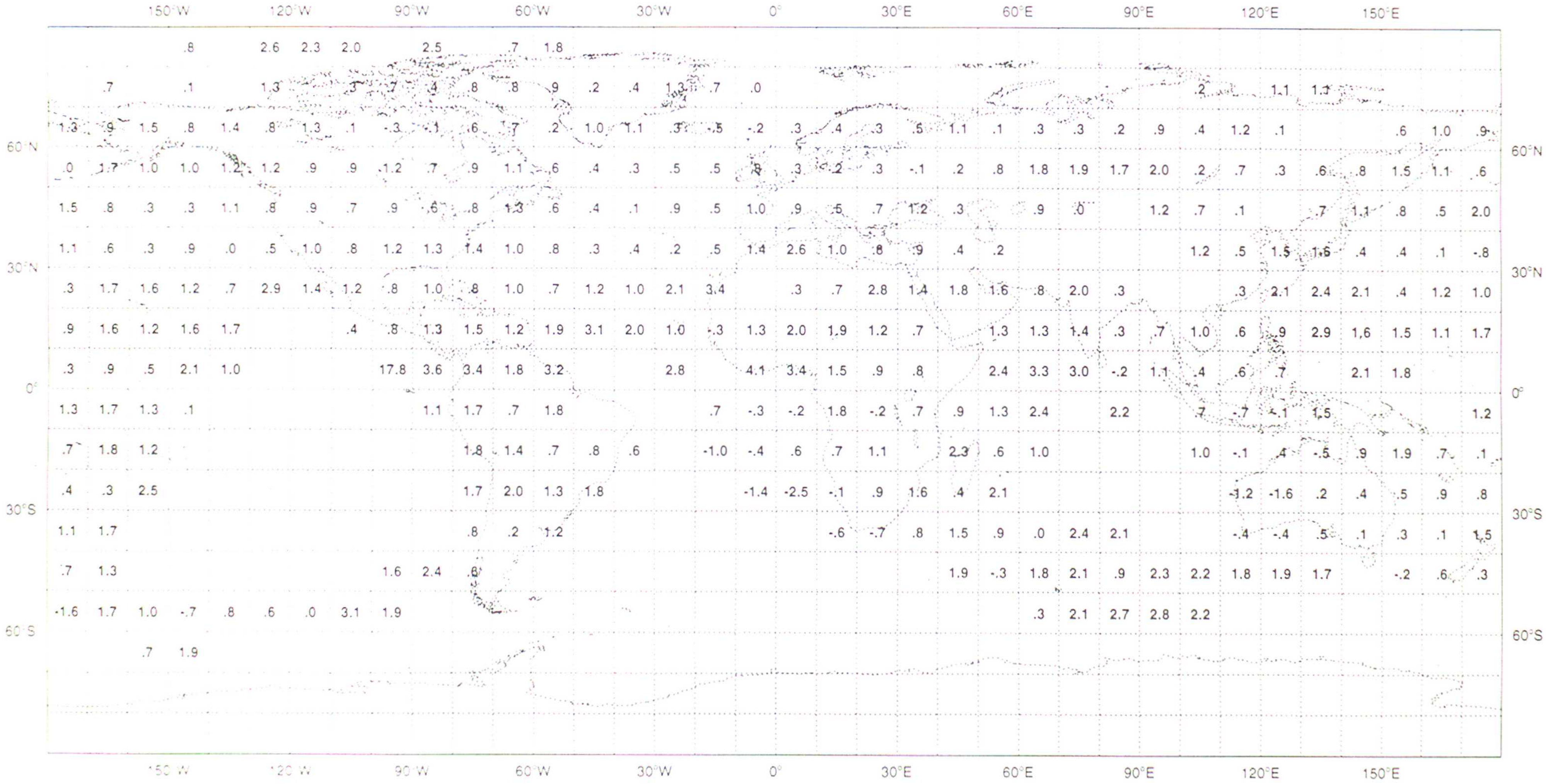

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.8 2.6 2.3 2.0 2.5 .7 1.8
.7 .1 1.3 .3 .7 .4 .8 .8 .9 .2 .4 1.3 .7 .0 .2 1.1 1.1
1.3 .9 1.5 .8 1.4 .8 1.3 .1 -.3 -.1 .6 .7 .2 1.0 1.1 .3 -.5 -.2 .3 .4 .3 .5 1.1 .1 .3 .3 .2 .9 .4 1.2 .1 .6 1.0 .9
.0 1.7 1.0 1.0 1.2 1.2 .9 .9 1.2 .7 .9 1.1 .6 .4 .3 .5 .5 .8 .3 .2 .3 -.1 .2 .8 1.8 1.9 1.7 2.0 .2 .7 .3 .6 .8 1.5 1.1 .6
1.5 .8 .3 .3 1.1 .8 .9 .7 .9 .6 .8 1.3 .6 .4 .1 .9 .5 1.0 .9 .5 .7 1.2 .3 .9 .0 1.2 .7 .1 .7 1.1 .8 .5 2.0
1.1 .6 .3 .9 .0 .5 1.0 .8 1.2 1.3 1.4 1.0 .8 .3 .4 .2 .5 1.4 2.6 1.0 .8 .9 .4 .2 1.2 .5 1.5 1.6 .4 .4 .1 -.8
.3 1.7 1.6 1.2 .7 2.9 1.4 1.2 .8 1.0 .8 1.0 .7 1.2 1.0 2.1 3.4 .3 .7 2.8 1.4 1.8 1.6 .8 2.0 .3 .3 2.1 2.4 2.1 .4 1.2 1.0
.9 1.6 1.2 1.6 1.7 .4 .8 1.3 1.5 1.2 1.9 3.1 2.0 1.0 -.3 1.3 2.0 1.9 1.2 .7 1.3 1.3 1.4 .3 .7 1.0 .6 .9 2.9 1.6 1.5 1.1 1.7
.3 .9 .5 2.1 1.0 17.8 3.6 3.4 1.8 3.2 2.8 4.1 3.4 1.5 .9 .8 2.4 3.3 3.0 -.2 1.1 .4 .6 .7 2.1 1.8
1.3 1.7 1.3 .1 1.1 1.7 .7 1.8 .7 -.3 -.2 1.8 -.2 .7 .9 1.3 2.4 2.2 .7 -.7 -.1 1.5 1.2
.7 1.8 1.2 1.8 1.4 .7 .8 .6 -1.0 -.4 .6 .7 1.1 2.3 .6 1.0 1.0 -.1 .4 -.5 .9 1.9 .7 .1
.4 .3 2.5 1.7 2.0 1.3 1.8 -1.4 -2.5 -.1 .9 1.6 .4 2.1 -1.2 -1.6 .2 .4 .5 .9 .8
1.1 1.7 .8 .2 1.2 -.6 -.7 .8 1.5 .9 .0 2.4 2.1 -.4 -.4 .5 .1 .3 .1 1.5
.7 1.3 1.6 2.4 .8 1.9 -.3 1.8 2.1 .9 2.3 2.2 1.8 1.9 1.7 -.2 .6 .3
-1.6 1.7 1.0 -.7 .8 .6 .0 3.1 1.9 .3 2.1 2.7 2.8 2.2
.7 1.9

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

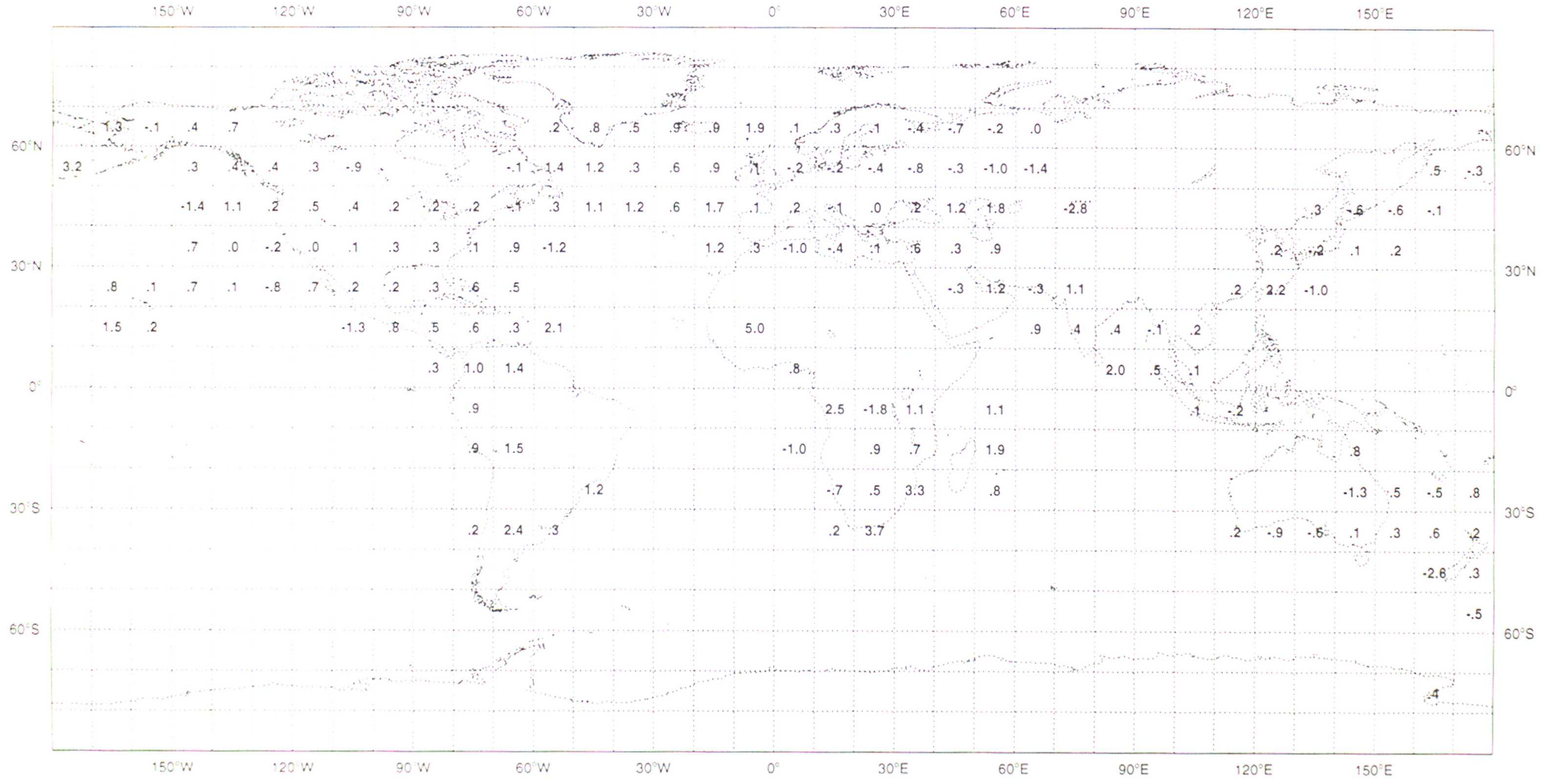

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.3 -.1 .4 .7 .2 .8 .5 .9 .9 1.9 .1 .3 .1 -.4 -.7 -.2 .0
3.2 .3 .4 .4 .3 -.9 -.1 -1.4 1.2 .3 .6 .9 .1 -.2 -.2 -.4 -.8 -.3 -1.0 -1.4 .5 -.3
-1.4 1.1 .2 .5 .4 .2 .2 .2 -.1 .3 1.1 1.2 .6 1.7 .1 .2 -.1 .0 .2 1.2 1.8 -2.8 .3 -.6 -.6 -.1
.7 .0 -.2 .0 .1 .3 .3 .1 .9 -1.2 1.2 .3 -1.0 -.4 .1 .6 .3 .9 .2 -.2 .1 .2
.8 .1 .7 .1 -.8 .7 .2 .2 .3 .6 .5 -.3 1.2 -.3 1.1 .2 2.2 -1.0
1.5 .2 -1.3 .8 .5 .6 .3 2.1 5.0 .9 .4 .4 -.1 .2
.3 1.0 1.4 .8 2.0 .5 .1
.9 2.5 -1.8 1.1 1.1 .1 -.2
.9 1.5 -1.0 .9 .7 1.9 .8
1.2 -.7 .5 3.3 .8 -1.3 .5 -.5 .8
.2 2.4 .3 .2 3.7 .2 -.9 -.6 .1 .3 .6 .2
-2.6 .3
-.5
.4

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). JANUARY 2002

Observations with O-B vector difference greater than 60 ms-1 excluded

Values are printed where greater than 30 obs are present

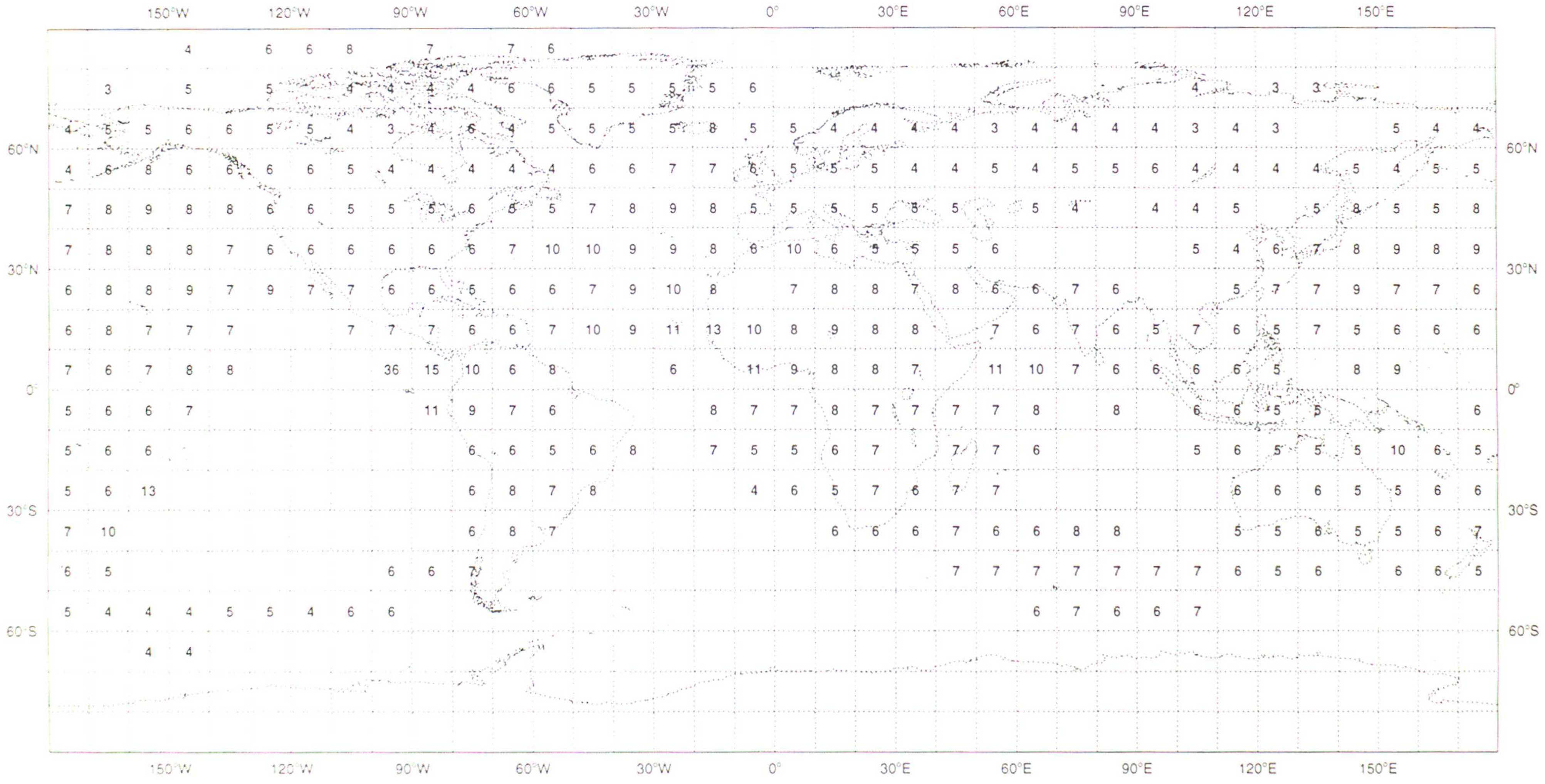

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). JANUARY 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

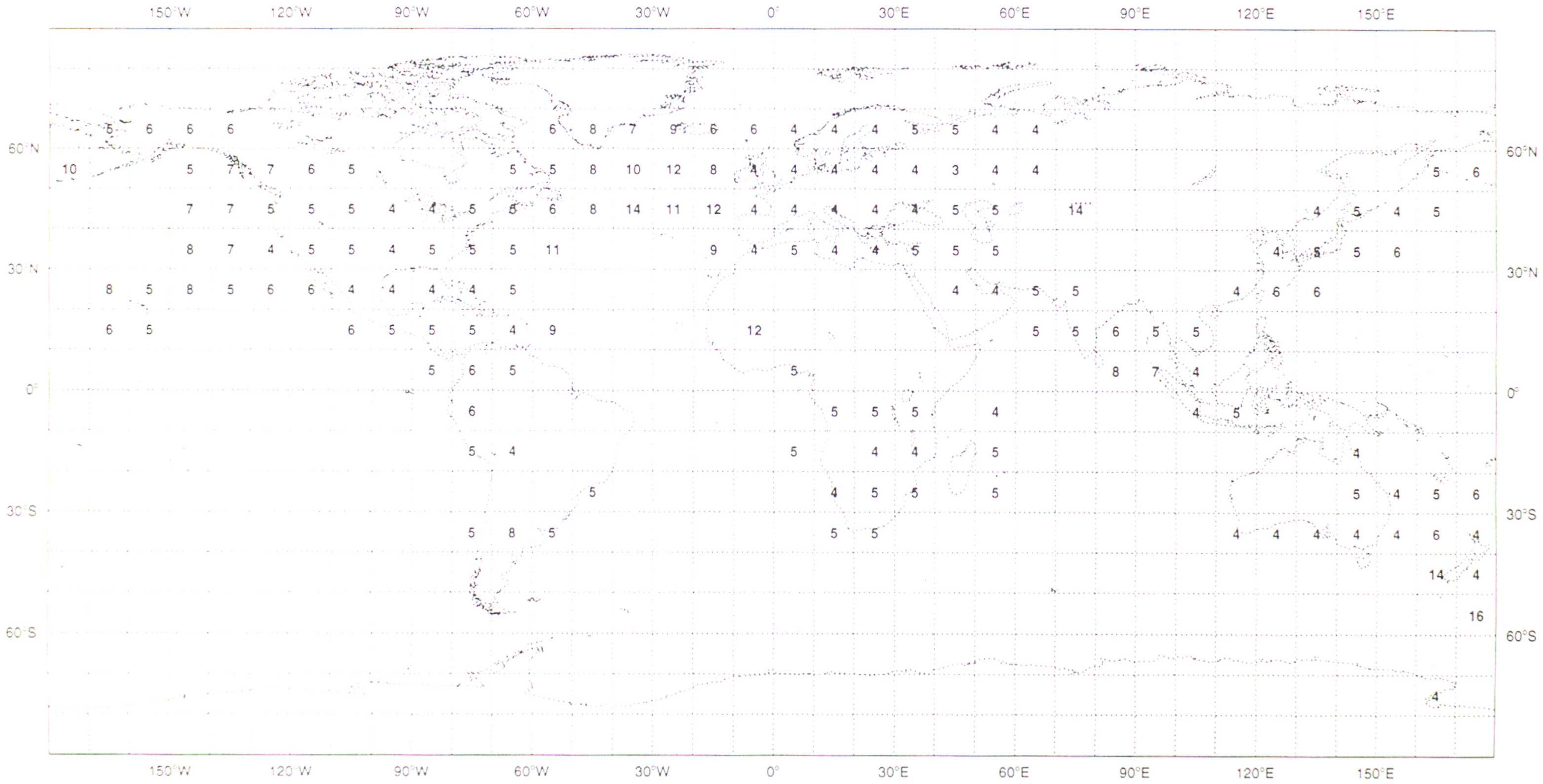

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown duringperiod.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
20674	12	Z	30	73/ 80	10	1	103.8	238.6	260.2	6
23418	00	Z	30	65/ 57	24	1	119.6	240.2	268.3	4
23933	12	Z	30	61/ 69	12	2	124.5	187.6	225.2	4
31168	00	Z	200	56/ 138	18	0	74.4	71.1	102.9	5
32098	00	Z	100	49/ 143	29	0	46.8	157.9	164.7	5
33345	00	Z	70	50/ 31	19	0	70.6	-122.7	141.5	5
33837	00	Z	50	46/ 31	13	0	137.4	110.3	176.2	6
34247	12	Z	50	50/ 41	27	1	93.9	201.4	222.2	8
34300	00	Z	50	50/ 36	18	0	76.9	-120.2	142.7	4
42027	00	Z	1000	34/ 75	15	2	31.5	43.3	53.5	4
42101	00	Z	200	30/ 76	25	1	89.6	-53.2	104.2	6
42101	12	Z	50	30/ 76	22	0	103.8	139.8	174.2	4
42339	00	Z	200	26/ 73	18	0	76.9	-52.0	92.9	4
42339	12	Z	200	26/ 73	14	2	80.2	-55.1	97.4	5
42369	00	Z	150	27/ 81	15	1	44.9	-113.6	122.2	6
42369	12	Z	150	27/ 81	15	0	79.9	-75.2	109.7	6
42397	00	Z	100	27/ 88	12	2	60.6	-191.2	200.6	8
42397	12	Z	100	27/ 88	15	0	71.8	-131.7	150.0	5
42647	00	Z	150	23/ 73	15	0	96.2	-53.8	110.3	6
42647	12	Z	50	23/ 73	13	1	109.3	226.5	251.4	8
42667	00	Z	200	23/ 77	17	0	66.0	-113.2	131.0	6
42701	00	Z	150	23/ 85	18	0	65.1	-99.1	118.6	4
42701	12	Z	200	23/ 85	13	1	51.5	-93.0	106.3	7
42724	00	Z	200	24/ 91	26	0	79.1	-98.7	126.5	8
42724	12	Z	50	24/ 91	10	0	202.7	-139.3	246.0	8
42809	12	Z	150	23/ 88	21	0	102.8	-89.5	136.3	5
42867	00	Z	150	21/ 79	24	0	55.4	-117.2	129.7	5
42867	12	Z	30	21/ 79	11	0	121.6	201.9	235.7	6
43003	00	Z	100	19/ 73	15	0	68.9	-140.1	156.1	4
43003	12	Z	70	19/ 73	11	0	109.3	170.5	202.6	4
43041	00	Z	200	19/ 82	17	0	88.3	-23.1	91.2	4
43128	00	Z	150	17/ 78	26	1	105.8	-134.3	171.0	6
43150	00	Z	200	18/ 83	27	0	75.2	-72.5	104.4	4
43185	00	Z	100	16/ 81	10	0	64.4	-155.8	168.6	4
43192	00	Z	150	15/ 74	14	0	102.2	-142.0	175.0	7
43279	00	Z	200	13/ 80	24	0	60.7	-73.5	95.3	5
43295	00	Z	30	13/ 78	14	0	119.0	187.4	221.9	6
43346	00	Z	100	11/ 80	26	1	115.6	-85.3	143.7	6
43346	12	Z	30	11/ 80	20	0	106.2	212.9	237.9	4
43353	00	Z	100	10/ 76	14	0	97.4	-169.8	195.7	5
43369	00	Z	30	8/ 73	8	4	256.0	205.5	328.3	9
43371	00	Z	150	8/ 77	28	0	83.6	-86.6	120.4	6
43371	12	Z	30	8/ 77	14	2	100.5	262.8	281.4	4
61291	12	Z	100	13/ -8	4	0	27.4	108.0	111.4	4
82332	12	Z	50	-3/ -60	4	0	24.4	177.0	178.7	4
89512	12	Z	50	-71/ 12	14	0	81.5	248.0	261.1	6
89592	12	Z	30	-67/ 93	12	0	26.0	219.0	220.5	6
91366	00	Z	50	9/ 168	21	8	118.1	216.9	247.0	6
98433	00	Z	50	15/ 121	4	1	69.9	200.7	212.6	5

Figure 8. TEMP 500 hPa geopotential mean daily count. JANUARY 2002
All hours
Global average number of observations in 24 hours = 1160

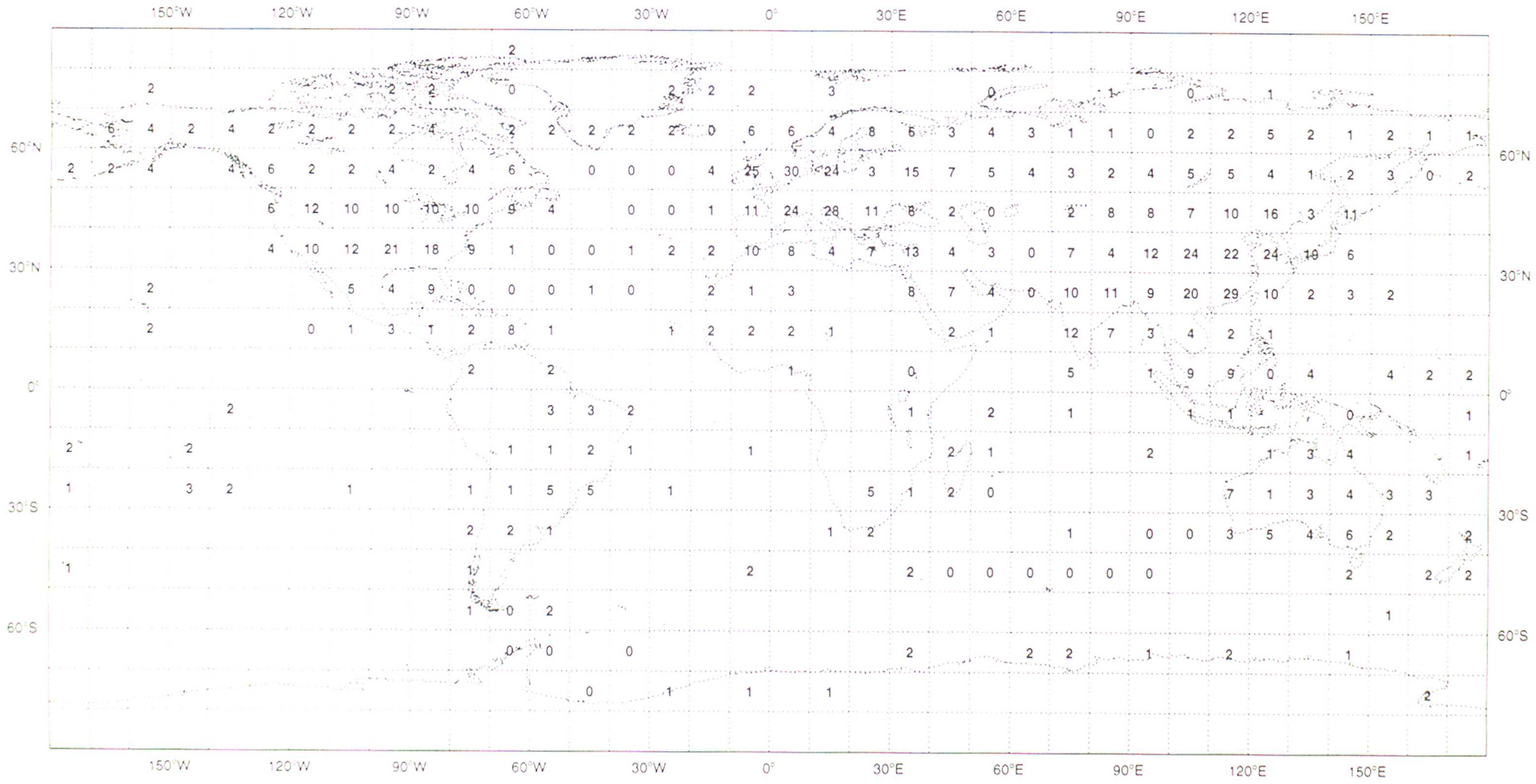

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 0 2 2 2 3 0 1 0 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 6 6 4 8 6 3 4 3 1 1 0 2 2 5 2 1 2 1 1
2 2 4 4 6 2 2 4 2 4 6 0 0 0 4 25 30 24 3 15 7 5 4 3 2 4 5 5 4 1 2 3 0 2
6 12 10 10 10 10 9 4 0 0 1 11 24 28 11 8 2 0 2 8 8 7 10 16 3 11
4 10 12 21 18 9 1 0 0 1 2 2 10 8 4 7 13 4 3 0 7 4 12 24 22 24 18 6
2 5 4 9 0 0 0 1 0 2 1 3 8 7 4 0 10 11 9 20 29 10 2 3 2
2 0 1 3 1 2 8 1 1 2 2 2 1 2 1 12 7 3 4 2 1
2 2 1 0 5 1 9 9 0 4 4 2 2
2 3 3 2 1 2 1 1 1 0 1
2 2 1 1 2 1 1 2 1 2 1 3 4 1
1 3 2 1 1 1 5 5 1 5 1 2 0 7 1 3 4 3 3
2 2 1 1 2 1 0 0 3 5 4 6 2 2
1 1 2 2 0 0 0 0 0 0 2 2 2
1 0 2 1
0 0 0 2 2 2 1 2 1
0 1 1 1 2

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : ≥ 10 observations and ≥ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	100	-5/ -81	21	0	100	1.0	-1.4	26.5	2
PSPIU	12	V	150	-5/ -81	22	0	100	-3.6	0.7	27.9	3
10035	12	V	300	55/ 10	26	0	3	-0.5	2.5	15.1	1
29612	12	V	300	55/ 78	10	0	100	-1.8	-13.0	15.0	1
40100	00	V	400	34/ 35	25	0	8	-1.9	-1.2	18.9	1
40265	00	V	150	32/ 36	22	0	9	-4.8	-3.0	28.5	1
40394	00	V	200	27/ 42	27	0	100	-1.6	2.9	16.3	2
40754	00	V	250	36/ 51	14	0	7	1.9	2.4	15.7	1
41594	12	V	250	32/ 73	11	0	72	-27.7	4.0	32.4	2
41768	12	V	500	26/ 70	11	0	45	-11.7	6.6	20.5	1
41780	12	V	300	25/ 67	12	0	8	3.1	-1.7	15.5	1
41923	00	V	250	24/ 90	20	0	5	0.7	6.7	33.5	2
42182	00	V	250	29/ 77	21	0	100	-13.6	1.9	18.5	2
42182	12	V	250	29/ 77	19	0	100	-11.7	3.6	16.7	2
42369	00	V	200	27/ 81	16	0	100	-13.6	-0.1	22.6	5
42379	00	V	300	27/ 83	20	0	100	-0.3	6.8	17.7	3
42379	12	V	250	27/ 83	13	0	100	-6.9	6.6	19.9	2
42397	00	V	200	27/ 88	13	0	100	-8.3	-3.0	16.9	1
42410	00	V	300	26/ 92	11	0	90	-3.1	4.6	19.7	1
42647	12	V	400	23/ 73	21	0	4	2.0	4.8	15.8	1
42667	00	V	400	23/ 77	27	0	100	-1.9	11.5	15.1	1
42667	12	V	300	23/ 77	13	0	100	-0.7	12.6	16.0	1
43369	12	V	300	8/ 73	12	0	100	3.4	-4.7	18.5	1
48327	12	V	300	19/ 99	13	0	15	0.6	-7.3	15.3	1
48407	12	V	150	15/ 105	24	0	100	-13.2	-5.2	17.8	1
55696	00	V	300	28/ 92	10	0	100	2.2	-9.1	20.3	1
56691	00	V	150	27/ 104	30	0	100	10.8	4.7	15.8	1
56691	12	V	100	27/ 104	25	1	100	13.6	3.9	22.4	3
57816	12	V	200	26/ 107	30	0	100	-3.6	8.8	15.7	2
58968	00	V	200	25/ 122	28	0	100	-1.4	6.7	21.6	4
60620	12	V	150	28/ 0	13	0	100	-21.8	-6.1	27.6	4
62337	00	V	100	31/ 34	25	0	100	-10.1	8.1	21.4	5
62337	12	V	100	31/ 34	25	0	100	-11.3	9.0	22.2	4
62378	00	V	200	30/ 31	26	0	100	-13.6	-5.7	22.1	4
62378	12	V	200	30/ 31	21	1	100	-12.1	-6.4	21.2	3
65548	12	V	250	7/ -8	14	0	7	5.3	-4.7	16.8	1
68442	12	V	200	-29/ 26	12	0	100	-17.3	-0.1	20.3	2
68512	12	V	200	-30/ 18	22	0	100	-13.7	1.7	17.8	2
72451	12	V	400	38/-100	30	0	3	-2.6	0.5	16.9	1
87623	12	V	150	-37/ -64	27	0	3	-3.5	-0.6	20.8	1
89009	00	V	300	-90/ 0	24	0	100	-4.8	4.5	19.5	3
89009	12	V	300	-90/ 0	26	0	100	-2.9	4.2	19.2	2
98223	00	V	200	18/ 121	14	1	78	10.4	10.6	21.9	5

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. JANUARY 2002

All hours

Global average number of observations in 24 hours = 1329

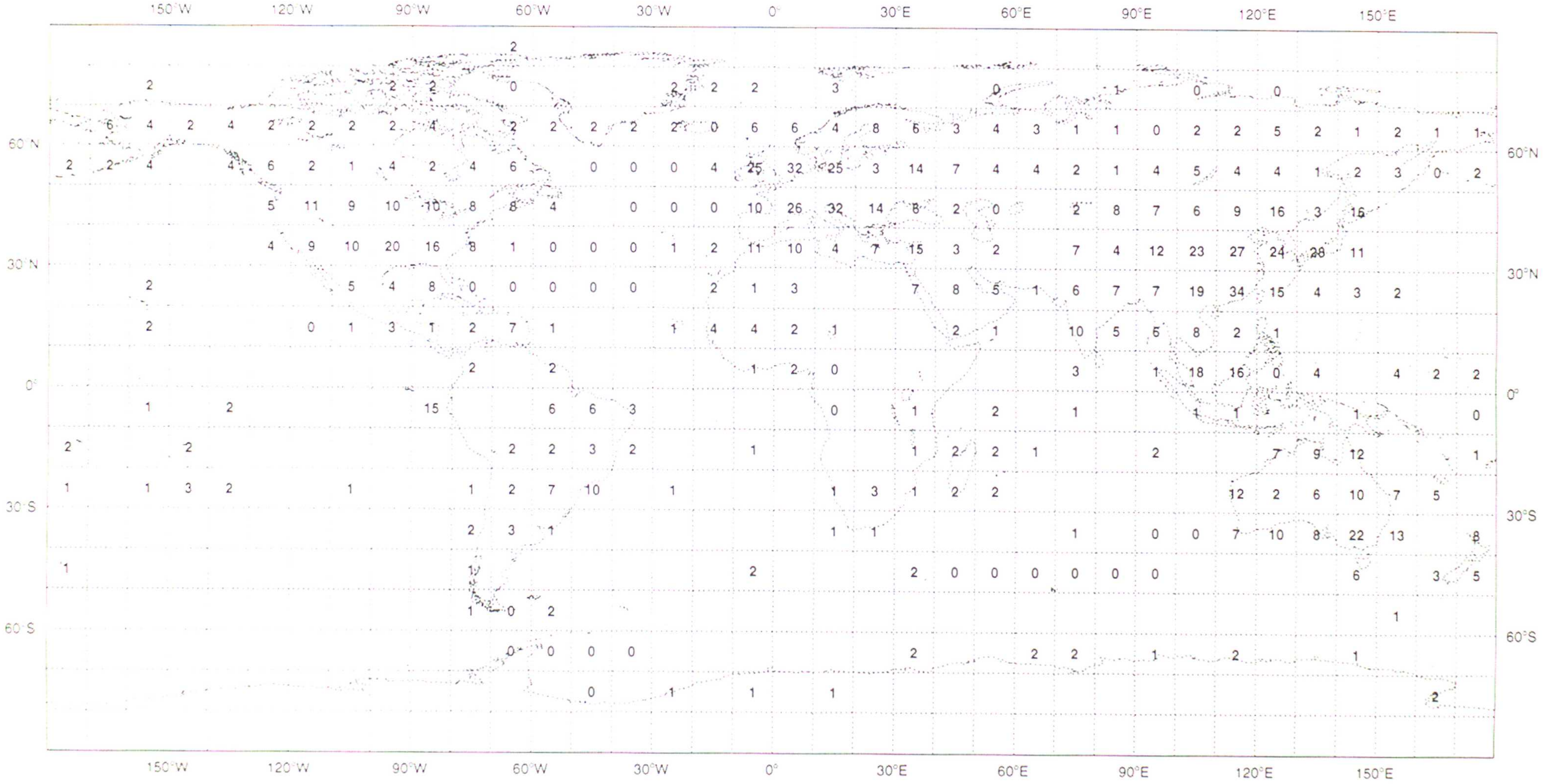

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 0 2 2 2 3 0 1 0 0
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 6 6 4 8 6 3 4 3 1 1 0 2 2 5 2 1 2 1 1
2 2 4 4 6 2 1 4 2 4 6 0 0 0 4 25 32 25 3 14 7 4 4 2 1 4 5 4 4 1 2 3 0 2
5 11 9 10 10 8 8 4 0 0 0 10 26 32 14 8 2 0 2 8 7 6 9 16 3 15
4 9 10 20 16 8 1 0 0 0 1 2 11 10 4 7 15 3 2 7 4 12 23 27 24 28 11
2 5 4 8 0 0 0 0 0 2 1 3 7 8 5 1 6 7 7 19 34 15 4 3 2
2 0 1 3 1 2 7 1 1 4 4 2 1 2 1 10 5 5 8 2 1
2 2 1 2 0 3 1 18 16 0 4 4 2 2
1 2 15 6 6 3 0 1 2 1 1 1 1 0
2 2 2 2 3 2 1 1 2 2 1 2 7 9 12 1
1 1 3 2 1 1 2 7 10 1 1 3 1 2 2 12 2 6 10 7 5
2 3 1 1 1 1 0 0 7 10 8 22 13 8
1 1 2 2 0 0 0 0 0 0 6 3 5
1 0 2 1
0 0 0 0 2 2 2 1 2 1
0 1 1 1 2

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5, and ABSOLUTE BIAS ≥ 10°, with SD < 30°, and MAX SPREAD < 10°	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
08594	12	DD	17/ -23	20	-11.3	4.9	12.9
29612	12	DD	55/ 78	10	24.6	5.2	7.6
42397	00	DD	27/ 88	17	10.9	4.5	10.8
42667	12	DD	23/ 77	11	-23.9	8.7	8.7
59981	00	DD	17/ 112	28	14.4	3.0	19.5
59981	12	DD	17/ 112	26	14.1	3.1	22.2
62337	00	DD	31/ 34	27	-21.2	4.7	8.4
62337	12	DD	31/ 34	27	-20.2	5.7	11.0
78583	12	DD	18/ -88	15	10.7	6.0	22.0
91366	00	DD	9/ 168	20	12.5	9.5	24.8

MONITORING OF SATELLITE WINDS

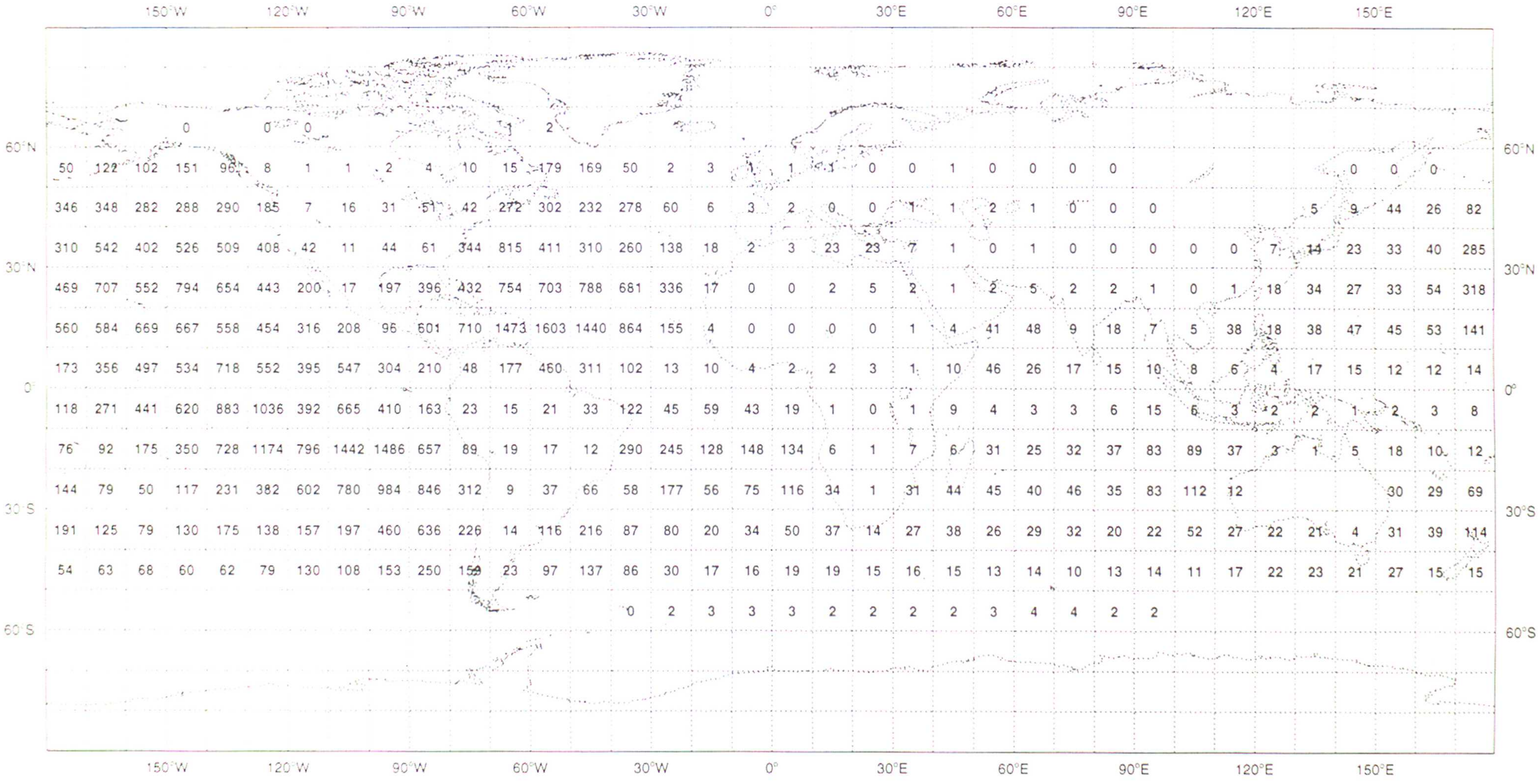
MONITORING CENTRE: BRACKNELL

MONTH: January 2002

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. JANUARY 2002
Global average number of observations in 24 hours = 60801



			0		0	0					1	2																							
50	122	102	151	96	8	1	1	2	4	10	15	179	169	50	2	3	1	1	1	0	0	1	0	0	0	0						0	0	0	
346	348	282	288	290	185	7	16	31	51	42	272	302	232	278	60	6	3	2	0	0	1	1	2	1	0	0	0				5	9	44	26	82
310	542	402	526	509	408	42	11	44	61	344	815	411	310	260	138	18	2	3	23	23	7	1	0	1	0	0	0	0	0	7	14	23	33	40	285
469	707	552	794	654	443	200	17	197	396	432	754	703	788	681	336	17	0	0	2	5	2	1	2	5	2	2	1	0	1	18	34	27	33	54	318
560	584	669	667	558	454	316	208	96	601	710	1473	1603	1440	864	155	4	0	0	0	0	1	4	41	48	9	18	7	5	38	18	38	47	45	53	141
173	356	497	534	718	552	395	547	304	210	48	177	460	311	102	13	10	4	2	2	3	1	10	46	26	17	15	10	8	6	4	17	15	12	12	14
118	271	441	620	883	1036	392	665	410	163	23	15	21	33	122	45	59	43	19	1	0	1	9	4	3	3	6	15	6	3	2	2	1	2	3	8
76	92	175	350	728	1174	796	1442	1486	657	89	19	17	12	290	245	128	148	134	6	1	7	6	31	25	32	37	83	89	37	3	1	5	18	10	12
144	79	50	117	231	382	602	780	984	846	312	9	37	66	58	177	56	75	116	34	1	31	44	45	40	46	35	83	112	12				30	29	69
191	125	79	130	175	138	157	197	460	636	226	14	116	216	87	80	20	34	50	37	14	27	38	26	29	32	20	22	52	27	22	21	4	31	39	114
54	63	68	60	62	79	130	108	153	250	159	23	97	137	86	30	17	16	19	19	15	16	15	13	14	10	13	14	11	17	22	23	21	27	15	15
														0	2	3	3	3	2	2	2	2	3	4	4	2	2								

Figure 11. SATOB 701 - 1000 hPa vector mean wind. JANUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

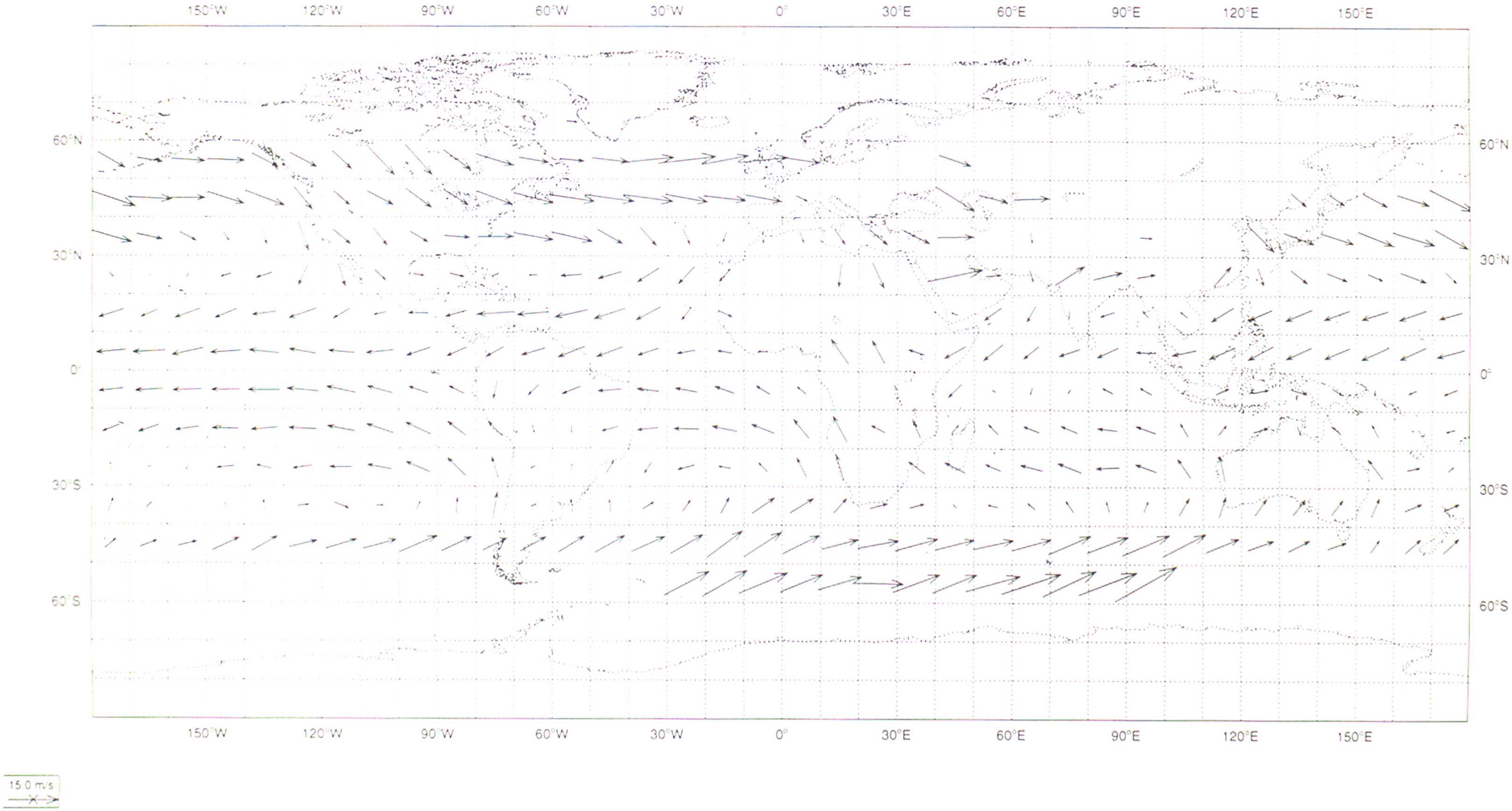
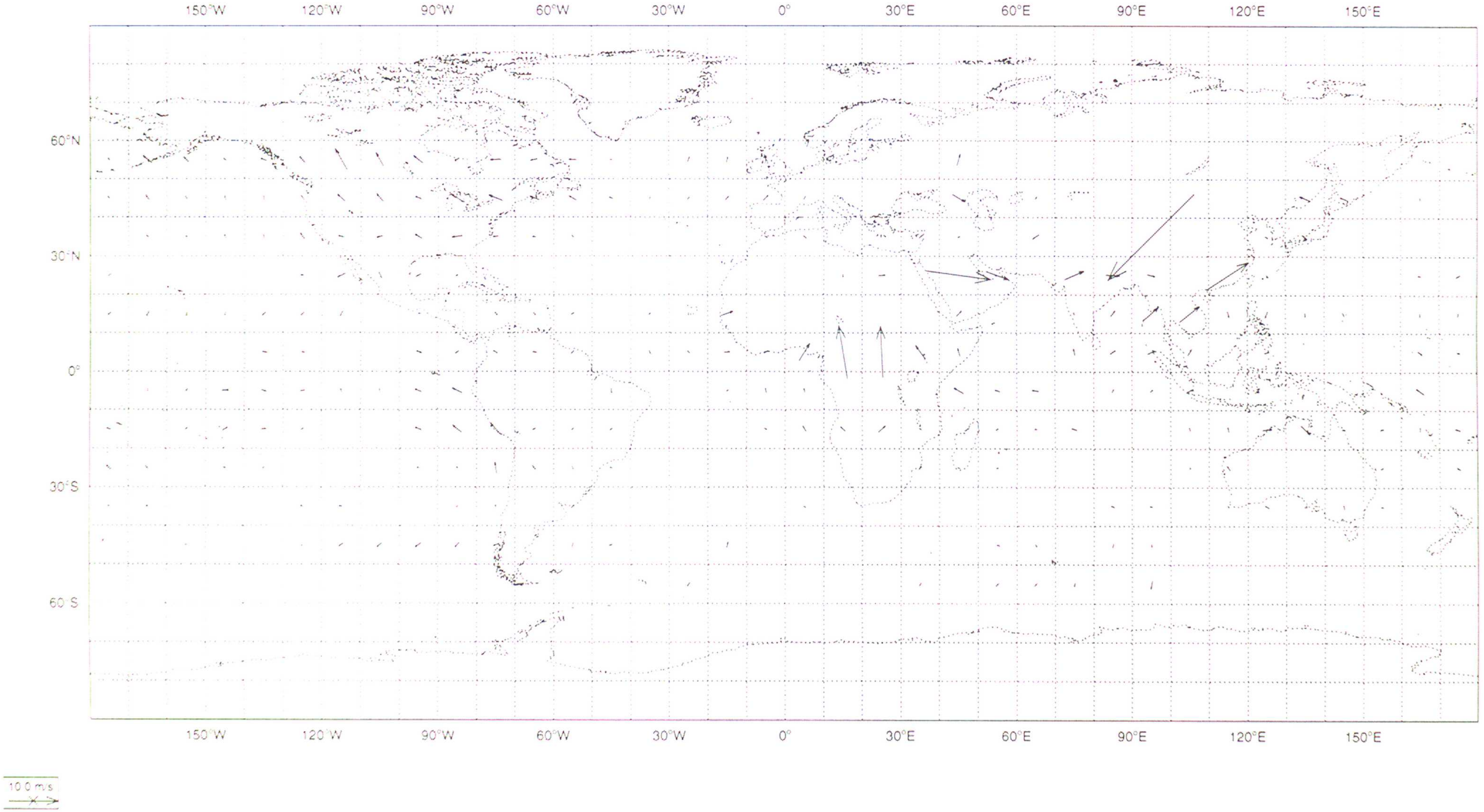

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 12. SATOB 701 - 1000 hPa vector wind differences. JANUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present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120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). JANUARY 2002

All observations

Values are plotted where greater than 10 obs are present

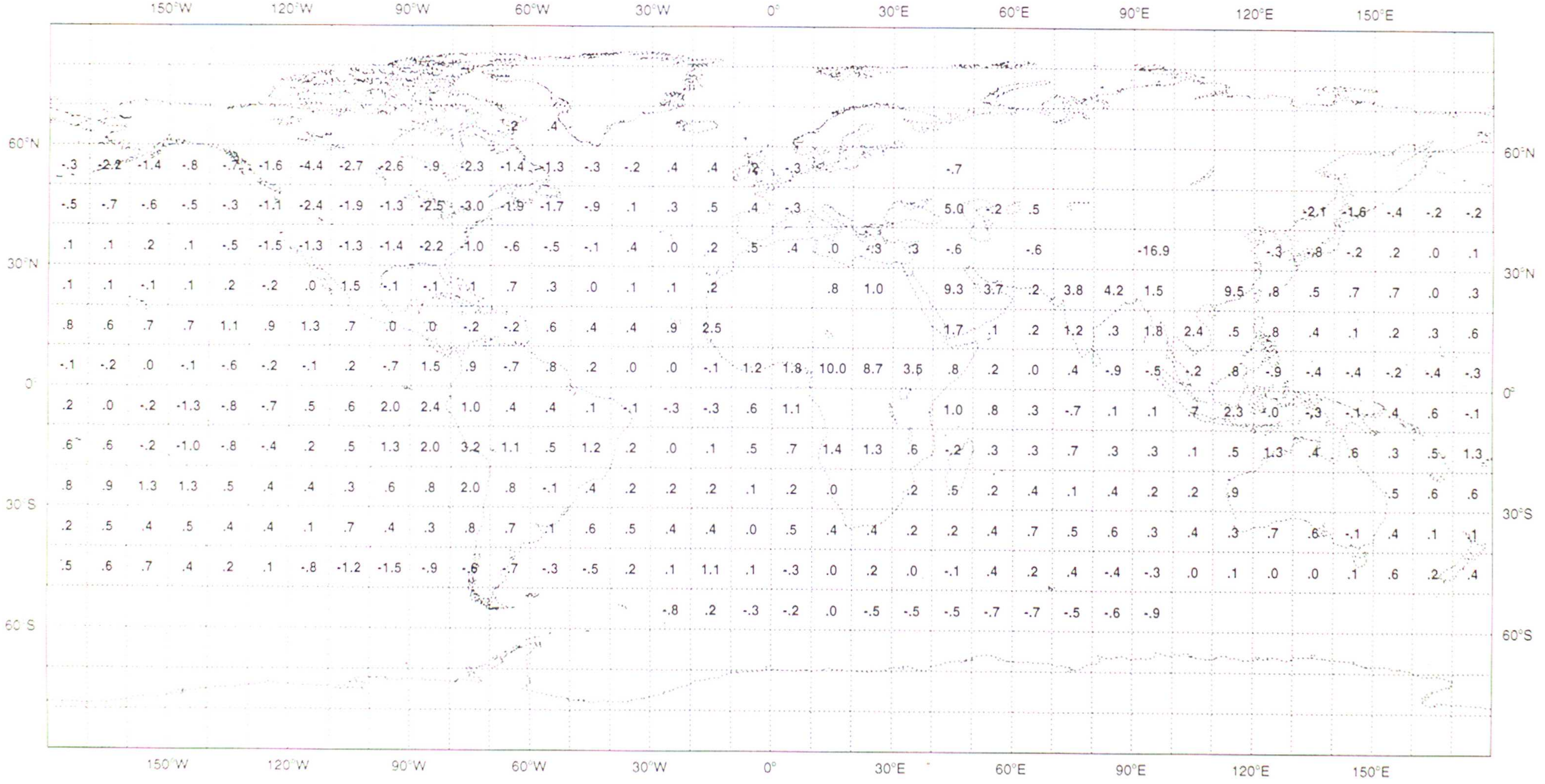

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.2 .4
-.3 -2.2 -1.4 -.8 -.7 -1.6 -4.4 -2.7 -2.6 -.9 -2.3 -1.4 -1.3 -.3 -.2 .4 .4 .2 -.3 -.7
-.5 -.7 -.6 -.5 -.3 -1.1 -2.4 -1.9 -1.3 -2.5 -3.0 -1.9 -1.7 -.9 .1 .3 .5 .4 -.3 5.0 -.2 .5 -2.1 -1.6 -.4 -.2 -.2
.1 .1 .2 .1 -.5 -1.5 -1.3 -1.3 -1.4 -2.2 -1.0 -.6 -.5 -.1 .4 .0 .2 .5 .4 .0 -.3 .3 -.6 -.6 -16.9 -.3 -.8 -.2 .2 .0 .1
.1 .1 -.1 .1 .2 -.2 .0 1.5 -.1 -.1 .1 .7 .3 .0 .1 .1 .2 .8 1.0 9.3 3.7 .2 3.8 4.2 1.5 9.5 .8 .5 .7 .7 .0 .3
.8 .6 .7 .7 1.1 .9 1.3 .7 .0 .0 -.2 -.2 .6 .4 .4 .9 2.5 1.7 .1 .2 1.2 .3 1.8 2.4 .5 .8 .4 .1 .2 .3 .6
-.1 -.2 .0 -.1 -.6 -.2 -.1 .2 -.7 1.5 .9 -.7 .8 .2 .0 .0 -.1 1.2 1.8 10.0 8.7 3.5 .8 .2 .0 .4 -.9 -.5 -.2 .8 -.9 -.4 -.4 -.2 -.4 -.3
.2 .0 -.2 -1.3 -.8 -.7 .5 .6 2.0 2.4 1.0 .4 .4 .1 -.1 -.3 -.3 .6 1.1 1.0 .8 .3 -.7 .1 .1 .7 2.3 .0 -.3 -.1 .4 .6 -.1
.6 .6 -.2 -1.0 -.8 -.4 .2 .5 1.3 2.0 3.2 1.1 .5 1.2 .2 .0 .1 .5 .7 1.4 1.3 .6 -.2 .3 .3 .7 .3 .3 .1 .5 1.3 .4 .6 .3 .5 1.3
.8 .9 1.3 1.3 .5 .4 .4 .3 .6 .8 2.0 .8 -.1 .4 .2 .2 .2 .1 .2 .0 .2 .5 .2 .4 .1 .4 .2 .2 .9 .5 .6 .6
.2 .5 .4 .5 .4 .4 .1 .7 .4 .3 .8 .7 .1 .6 .5 .4 .4 .0 .5 .4 .4 .2 .2 .4 .7 .5 .6 .3 .4 .3 .7 .6 -.1 .4 .1 .1
.5 .6 .7 .4 .2 .1 -.8 -1.2 -1.5 -.9 -.6 -.7 -.3 -.5 .2 .1 1.1 .1 -.3 .0 .2 .0 -.1 .4 .2 .4 -.4 -.3 .0 .1 .0 .0 .1 .6 .2 .4
-.8 .2 -.3 -.2 .0 -.5 -.5 -.5 -.7 -.7 -.5 -.6 -.9

Figure 14. SATOB 701 - 1000 hPa RMS O-B vector differences (ms-1). JANUARY 2002
All observations
Values are plotted where greater than 10 obs are present

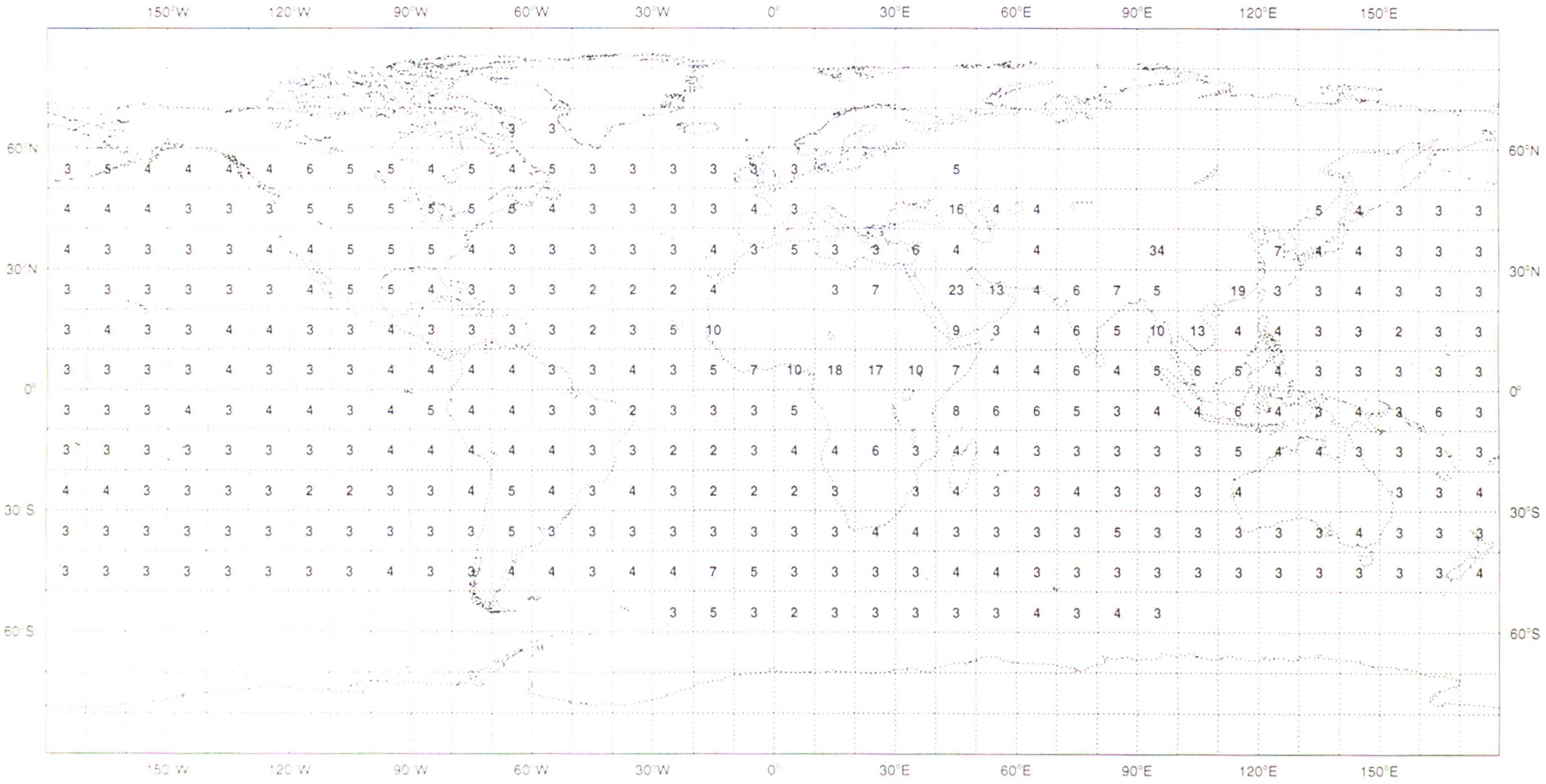

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3 3
3 5 4 4 4 4 6 5 5 4 5 4 5 3 3 3 3 3 3 5
4 4 4 3 3 3 5 5 5 5 5 5 4 3 3 3 3 4 3 16 4 4 5 4 3 3 3
4 3 3 3 3 4 4 5 5 5 4 3 3 3 3 3 4 3 5 3 3 6 4 4 34 7 4 4 3 3 3
3 3 3 3 3 3 4 5 5 4 3 3 3 2 2 2 4 3 7 23 13 4 6 7 5 19 3 3 4 3 3 3
3 4 3 3 4 4 3 3 4 3 3 3 3 2 3 5 10 9 3 4 6 5 10 13 4 4 3 3 2 3 3
3 3 3 3 4 3 3 3 4 4 4 4 3 3 4 3 5 7 10 18 17 10 7 4 4 6 4 5 6 5 4 3 3 3 3 3
3 3 3 4 3 4 4 3 4 5 4 4 3 3 2 3 3 3 5 8 6 6 5 3 4 4 6 4 3 4 3 6 3
3 3 3 3 3 3 3 3 4 4 4 4 4 3 3 2 2 3 4 4 6 3 4 4 3 3 3 3 3 5 4 4 3 3 3 3
4 4 3 3 3 3 2 2 3 3 4 5 4 3 4 3 2 2 2 3 3 4 3 3 4 3 3 3 4 3 3 4
3 3 3 3 3 3 3 3 3 3 3 5 3 3 3 3 3 3 3 3 4 4 3 3 3 3 5 3 3 3 3 3 4 3 3 3
3 3 3 3 3 3 3 3 4 3 3 4 4 3 4 4 7 5 3 3 3 3 4 4 3 3 3 3 3 3 3 3 3 3 3 4
3 5 3 2 3 3 3 3 3 4 3 4 3

Figure 15. SATOB 401 - 700 hPa mean daily count. JANUARY 2002
Global average number of observations in 24 hours = 16907

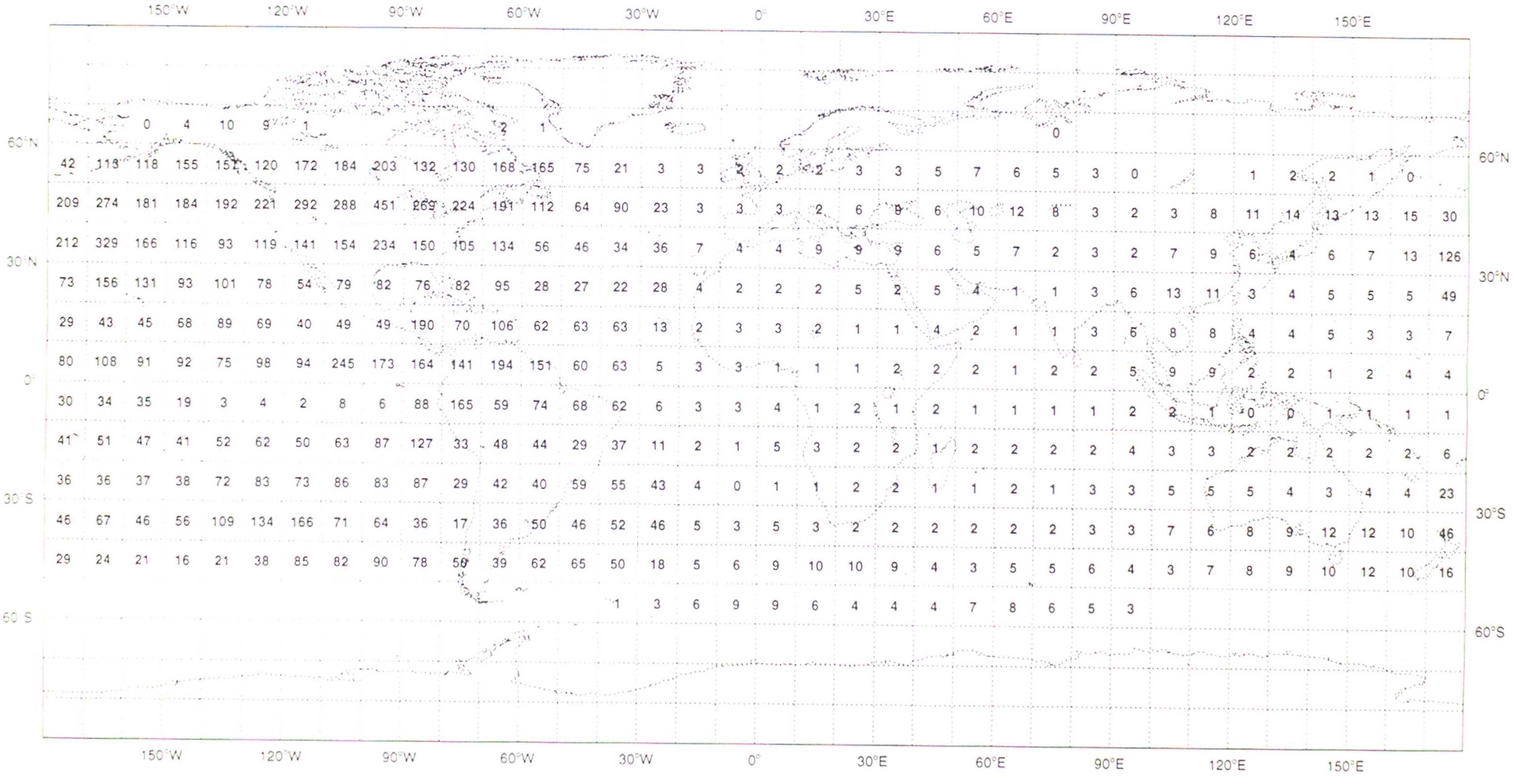

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0 4 10 9 1 2 1 0
42 118 118 155 151 120 172 184 203 132 130 168 165 75 21 3 3 2 2 2 3 3 5 7 6 5 3 0 1 2 2 1 0
209 274 181 184 192 221 292 288 451 269 224 191 112 64 90 23 3 3 3 2 6 9 6 10 12 8 3 2 3 8 11 14 13 13 15 30
212 329 166 116 93 119 141 154 234 150 105 134 56 46 34 36 7 4 4 9 9 9 6 5 7 2 3 2 7 9 6 4 6 7 13 126
73 156 131 93 101 78 54 79 82 76 82 95 28 27 22 28 4 2 2 2 5 2 5 4 1 1 3 6 13 11 3 4 5 5 5 49
29 43 45 68 89 69 40 49 49 190 70 106 62 63 63 13 2 3 3 2 1 1 4 2 1 1 3 6 8 8 4 4 5 3 3 7
80 108 91 92 75 98 94 245 173 164 141 194 151 60 63 5 3 3 1 1 1 2 2 2 1 2 2 5 9 9 2 2 1 2 4 4
30 34 35 19 3 4 2 8 6 88 165 59 74 68 62 6 3 3 4 1 2 1 2 1 1 1 1 2 2 1 0 0 1 1 1 1
41 51 47 41 52 62 50 63 87 127 33 48 44 29 37 11 2 1 5 3 2 2 1 2 2 2 2 4 3 3 2 2 2 2 2 6
36 36 37 38 72 83 73 86 83 87 29 42 40 59 55 43 4 0 1 1 2 2 1 1 2 1 3 3 5 5 5 4 3 4 4 23
46 67 46 56 109 134 166 71 64 36 17 36 50 46 52 46 5 3 5 3 2 2 2 2 2 2 3 3 7 6 8 9 12 12 10 46
29 24 21 16 21 38 85 82 90 78 50 39 62 65 50 18 5 6 9 10 10 9 4 3 5 5 6 4 3 7 8 9 10 12 10 16
1 3 6 9 9 6 4 4 7 8 6 5 3

Figure 16. SATOB 401 - 700 hPa vector mean wind. JANUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

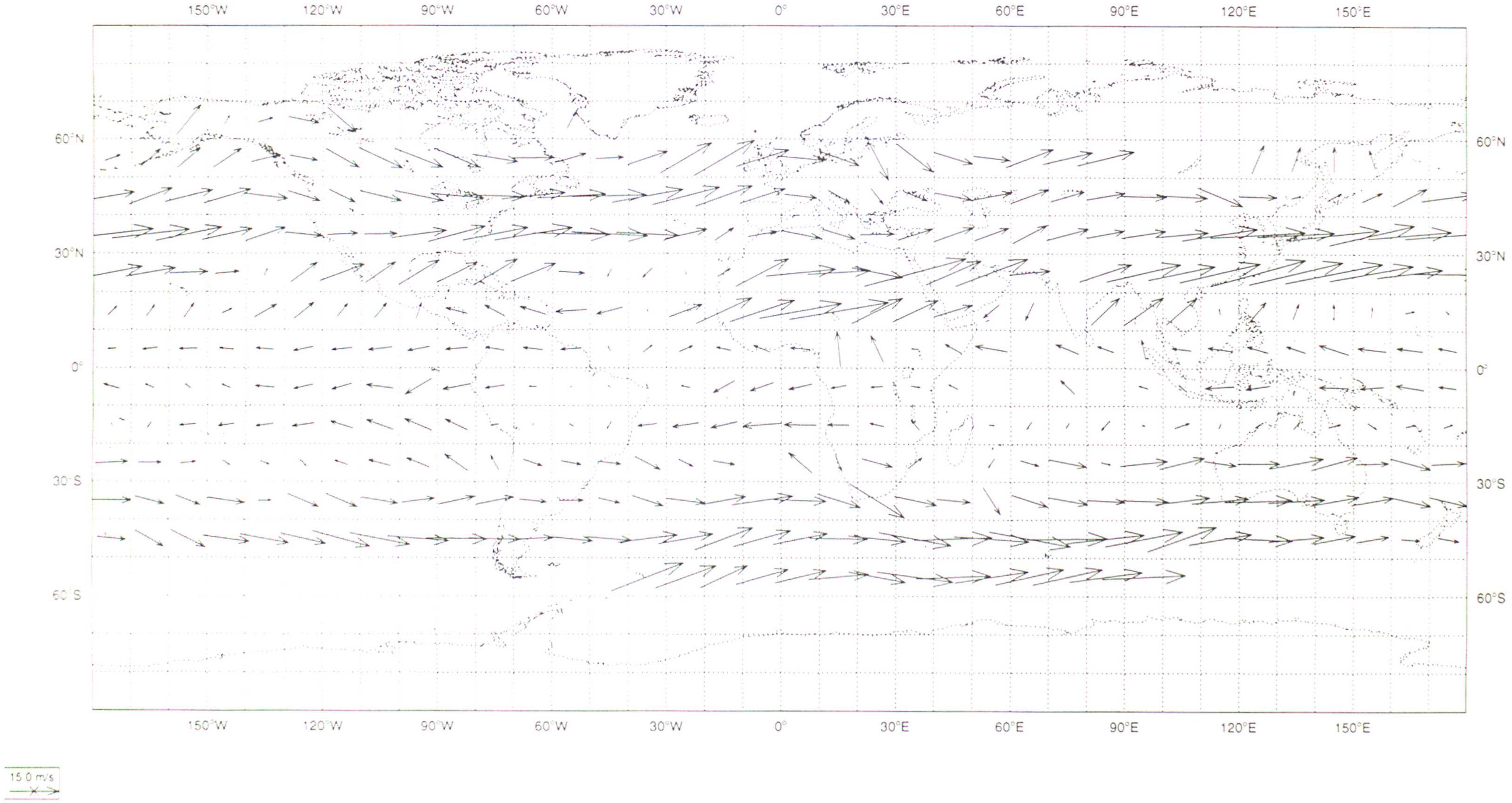

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 17. SATOB 401 - 700 hPa vector wind differences. JANUARY 2002

All observations

Arrows are plotted where greater than 10 obs are present

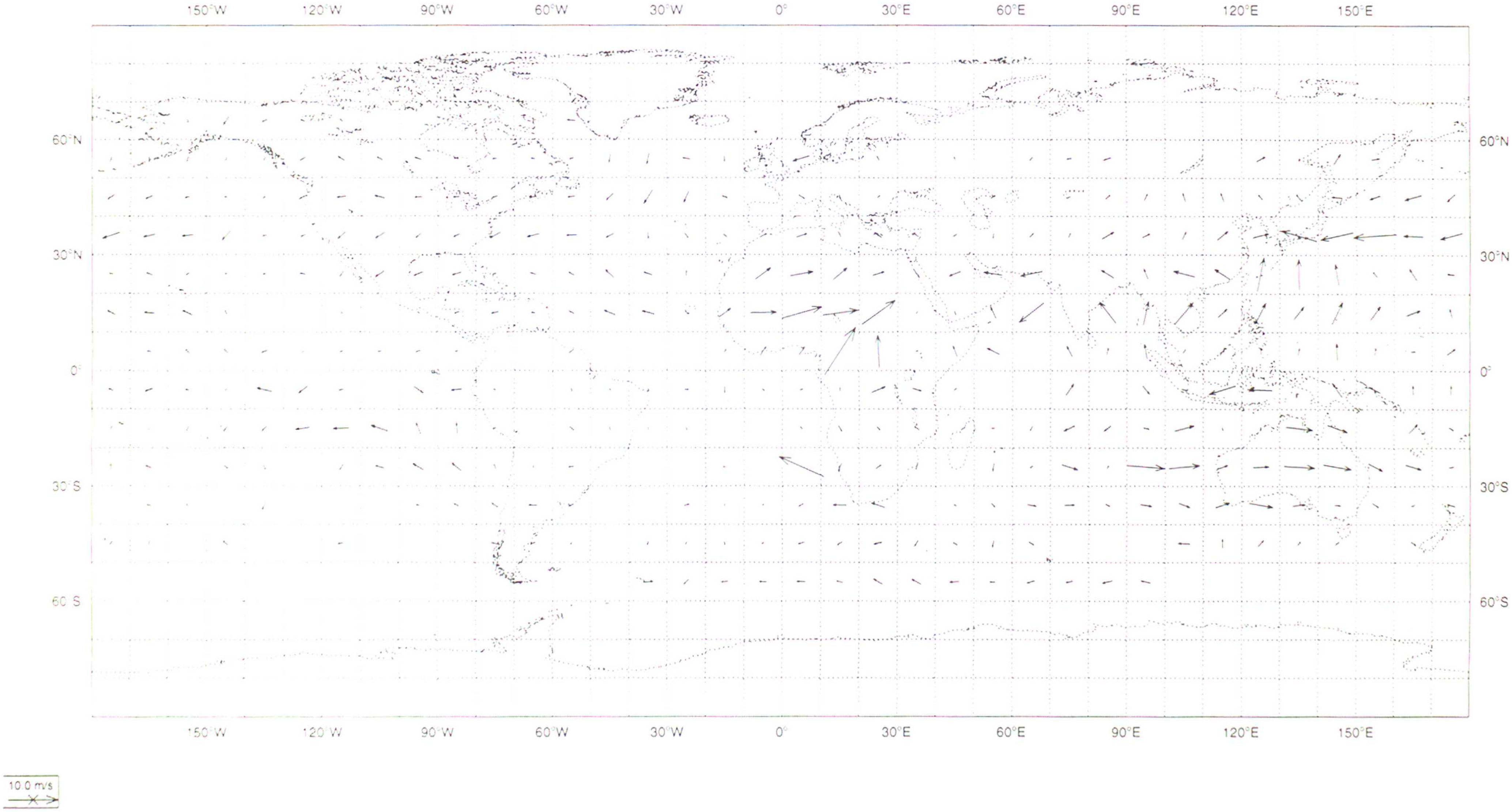

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). JANUARY 2002
All observations
Values are plotted where greater than 10 obs are present

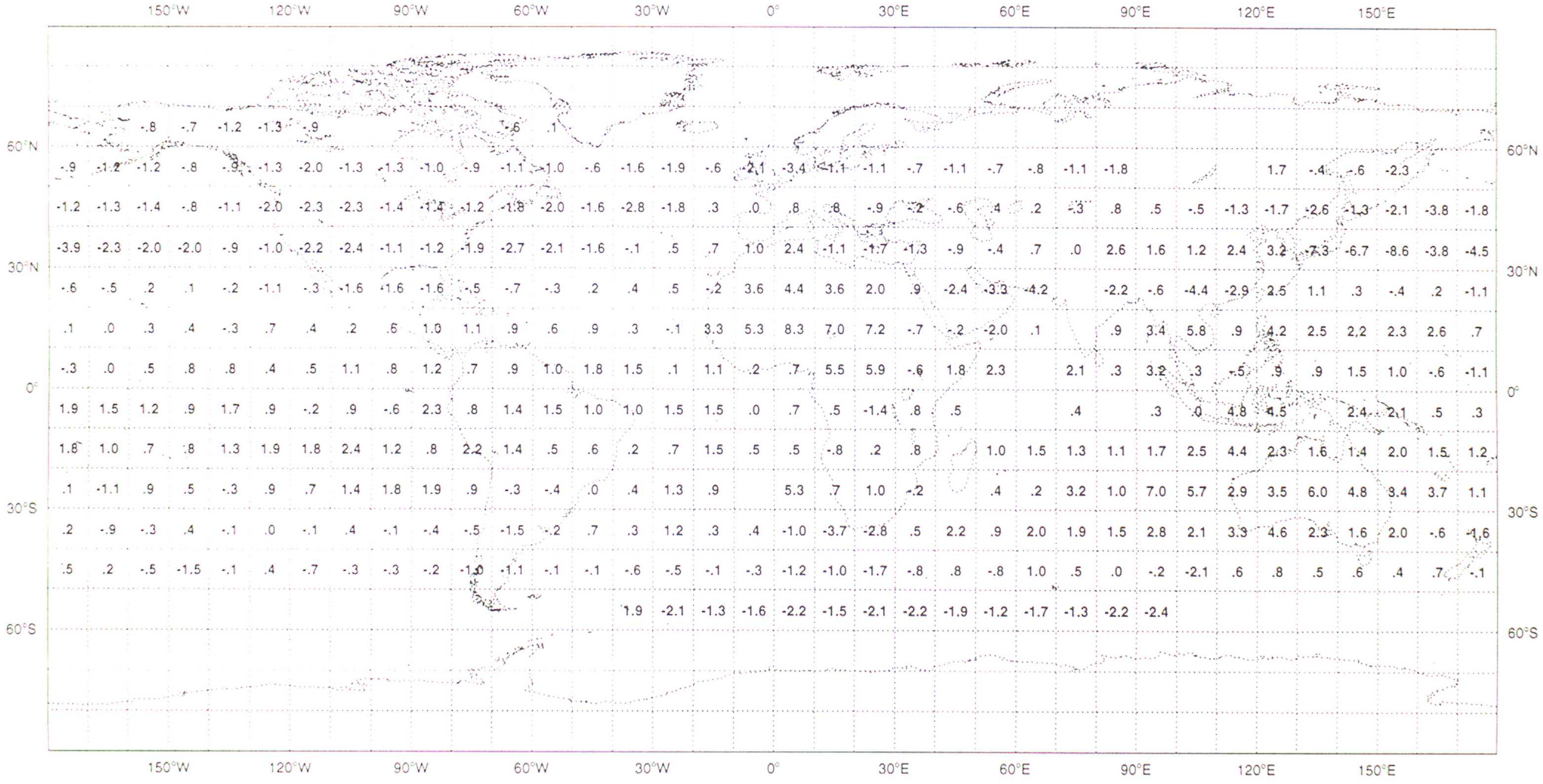
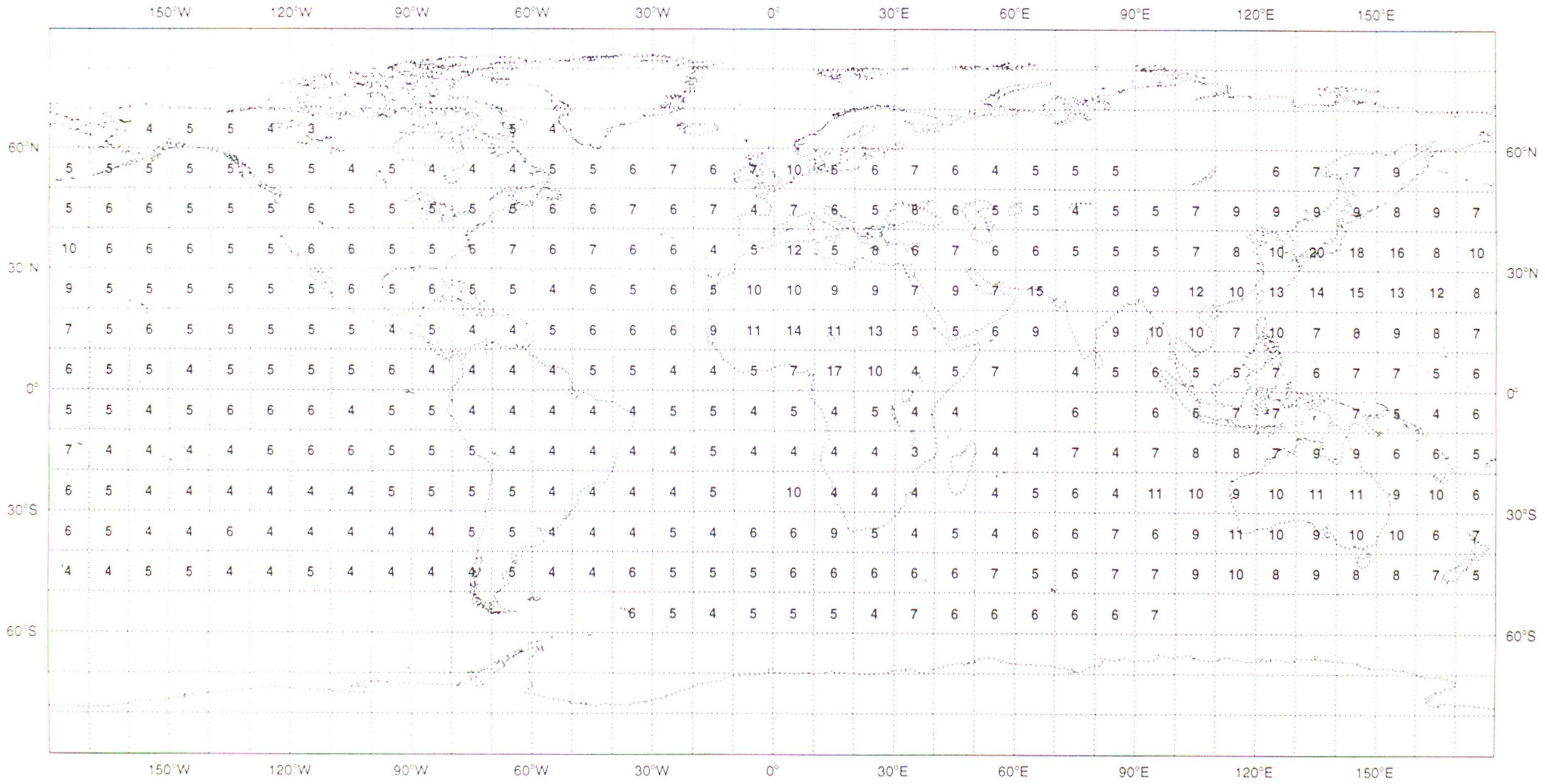

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-.8 -.7 -1.2 -1.3 -.9 -.6 .1
-.9 -1.2 -1.2 -.8 -.9 -1.3 -2.0 -1.3 -1.3 -1.0 -.9 -1.1 -1.0 -.6 -1.6 -1.9 -.6 -2.1 -3.4 -1.1 -1.1 -.7 -1.1 -.7 -.8 -1.1 -1.8 1.7 -.4 -.6 -2.3
-1.2 -1.3 -1.4 -.8 -1.1 -2.0 -2.3 -2.3 -1.4 -1.4 -1.2 -1.8 -2.0 -1.6 -2.8 -1.8 .3 .0 .8 .8 -.9 -.2 -.6 .4 .2 -.3 .8 .5 -.5 -1.3 -1.7 -2.6 -1.3 -2.1 -3.8 -1.8
-3.9 -2.3 -2.0 -2.0 -.9 -1.0 -2.2 -2.4 -1.1 -1.2 -1.9 -2.7 -2.1 -1.6 -.1 .5 .7 1.0 2.4 -1.1 -1.7 -1.3 -.9 -.4 .7 .0 2.6 1.6 1.2 2.4 3.2 -7.3 -6.7 -8.6 -3.8 -4.5
-.6 -.5 .2 .1 -.2 -1.1 -.3 -1.6 -1.6 -1.6 -.5 -.7 -.3 .2 .4 .5 -.2 3.6 4.4 3.6 2.0 .9 -2.4 -3.3 -4.2 -2.2 -.6 -4.4 -2.9 2.5 1.1 .3 -.4 .2 -1.1
.1 .0 .3 .4 -.3 .7 .4 .2 .6 1.0 1.1 .9 .6 .9 .3 -.1 3.3 5.3 8.3 7.0 7.2 -.7 -.2 -2.0 .1 .9 3.4 5.8 .9 4.2 2.5 2.2 2.3 2.6 .7
-.3 .0 .5 .8 .8 .4 .5 1.1 .8 1.2 .7 .9 1.0 1.8 1.5 .1 1.1 .2 .7 5.5 5.9 -.6 1.8 2.3 2.1 .3 3.2 .3 -.5 .9 .9 1.5 1.0 -.6 -1.1
1.9 1.5 1.2 .9 1.7 .9 -.2 .9 -.6 2.3 .8 1.4 1.5 1.0 1.0 1.5 1.5 .0 .7 .5 -1.4 .8 .5 .4 .3 .0 4.8 4.5 2.4 2.1 .5 .3
1.8 1.0 .7 .8 1.3 1.9 1.8 2.4 1.2 .8 2.2 1.4 .5 .6 .2 .7 1.5 .5 .5 -.8 .2 .8 1.0 1.5 1.3 1.1 1.7 2.5 4.4 2.3 1.6 1.4 2.0 1.5 1.2
.1 -1.1 .9 .5 -.3 .9 .7 1.4 1.8 1.9 .9 -.3 -.4 .0 .4 1.3 .9 5.3 .7 1.0 -.2 .4 .2 3.2 1.0 7.0 5.7 2.9 3.5 6.0 4.8 3.4 3.7 1.1
.2 -.9 -.3 .4 -.1 .0 -.1 .4 -.1 -.4 -.5 -1.5 -.2 .7 .3 1.2 .3 .4 -1.0 -3.7 -2.8 .5 2.2 .9 2.0 1.9 1.5 2.8 2.1 3.3 4.6 2.3 1.6 2.0 -.6 -1.6
.5 .2 -.5 -1.5 -.1 .4 -.7 -.3 -.3 -.2 -1.0 -1.1 -.1 -.1 -.6 -.5 -.1 -.3 -1.2 -1.0 -1.7 -.8 .8 -.8 1.0 .5 .0 -.2 -2.1 .6 .8 .5 .6 .4 .7 -.1
1.9 -2.1 -1.3 -1.6 -2.2 -1.5 -2.1 -2.2 -1.9 -1.2 -1.7 -1.3 -2.2 -2.4

Figure 19. SATOB 401 - 700 hPa RMS O-B vector differences (ms-1). JANUARY 2002
All observations
Values are plotted where greater than 10 obs are present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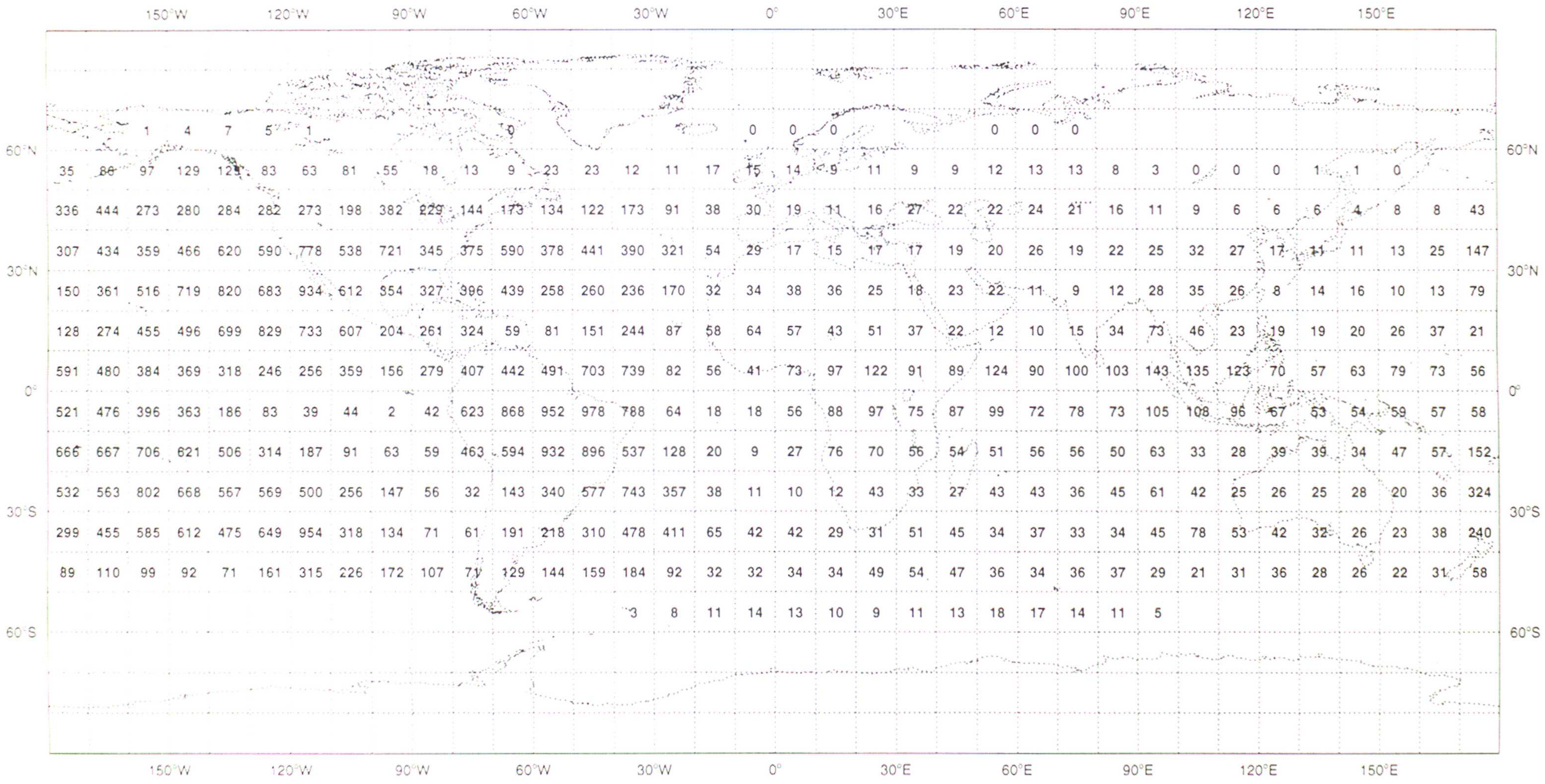
60°N
30°N
0°
30°S
60°S
4 5 5 4 3 5 4
5 5 5 5 5 5 5 4 5 4 4 4 5 5 6 7 6 7 10 5 6 7 6 4 5 5 5 6 7 7 9
5 6 6 5 5 5 6 5 5 5 5 5 6 6 7 6 7 4 7 6 5 8 6 5 5 4 5 5 7 9 9 9 9 8 9 7
10 6 6 6 5 5 6 6 5 5 6 7 6 7 6 6 4 5 12 5 8 6 7 6 6 5 5 5 7 8 10 20 18 16 8 10
9 5 5 5 5 5 5 6 5 6 5 5 4 6 5 6 5 10 10 9 9 7 9 7 15 8 9 12 10 13 14 15 13 12 8
7 5 6 5 5 5 5 5 4 5 4 4 5 6 6 6 9 11 14 11 13 5 5 6 9 9 10 10 7 10 7 8 9 8 7
6 5 5 4 5 5 5 5 6 4 4 4 4 5 5 4 4 5 7 17 10 4 5 7 4 5 6 5 5 7 6 7 7 5 6
5 5 4 5 6 6 6 4 5 5 4 4 4 4 4 5 5 4 5 4 5 4 4 6 6 6 7 7 7 5 4 6
7 4 4 4 4 6 6 6 5 5 5 4 4 4 4 4 5 4 4 4 4 3 4 4 7 4 7 8 8 7 9 9 6 6 5
6 5 4 4 4 4 4 4 5 5 5 5 4 4 4 4 5 10 4 4 4 4 5 6 4 11 10 9 10 11 11 9 10 6
6 5 4 4 6 4 4 4 4 4 5 5 4 4 4 5 4 6 6 9 5 4 5 4 6 6 7 6 9 11 10 9 10 10 6 7
4 4 5 5 4 4 5 4 4 4 4 5 4 4 6 5 5 5 6 6 6 6 6 7 5 6 7 7 9 10 8 9 8 8 7 5
6 5 4 5 5 5 4 7 6 6 6 6 6 7

Figure 20. SATOB 101 - 400 hPa mean daily count. JANUARY 2002
Global average number of observations in 24 hours = 69927



		1	4	7	5	1					0						0	0	0				0	0	0										
35	86	97	129	125	83	63	81	55	18	13	9	23	23	12	11	17	15	14	9	11	9	9	12	13	13	8	3	0	0	0	1	1	0		
336	444	273	280	284	282	273	198	382	229	144	173	134	122	173	91	38	30	19	11	16	27	22	22	24	21	16	11	9	6	6	6	4	8	8	43
307	434	359	466	620	590	778	538	721	345	375	590	378	441	390	321	54	29	17	15	17	17	19	20	26	19	22	25	32	27	17	11	11	13	25	147
150	361	516	719	820	683	934	612	354	327	396	439	258	260	236	170	32	34	38	36	25	18	23	22	11	9	12	28	35	26	8	14	16	10	13	79
128	274	455	496	699	829	733	607	204	261	324	59	81	151	244	87	58	64	57	43	51	37	22	12	10	15	34	73	46	23	19	19	20	26	37	21
591	480	384	369	318	246	256	359	156	279	407	442	491	703	739	82	56	41	73	97	122	91	89	124	90	100	103	143	135	123	70	57	63	79	73	56
521	476	396	363	186	83	39	44	2	42	623	868	952	978	788	64	18	18	56	88	97	75	87	99	72	78	73	105	108	96	67	53	54	59	57	58
666	667	706	621	506	314	187	91	63	59	463	594	932	896	537	128	20	9	27	76	70	56	54	51	56	56	50	63	33	28	39	39	34	47	57	152
532	563	802	668	567	569	500	256	147	56	32	143	340	577	743	357	38	11	10	12	43	33	27	43	43	36	45	61	42	25	26	25	28	20	36	324
299	455	585	612	475	649	954	318	134	71	61	191	218	310	478	411	65	42	42	29	31	51	45	34	37	33	34	45	78	53	42	32	26	23	38	240
89	110	99	92	71	161	315	226	172	107	71	129	144	159	184	92	32	32	34	34	49	54	47	36	34	36	37	29	21	31	36	28	26	22	31	58
														3	8	11	14	13	10	9	11	13	18	17	14	11	5								

Figure 21. SATOB 101 - 400 hPa vector mean wind. JANUARY 2002

All observations

Arrows are plotted where greater than 10 obs are present

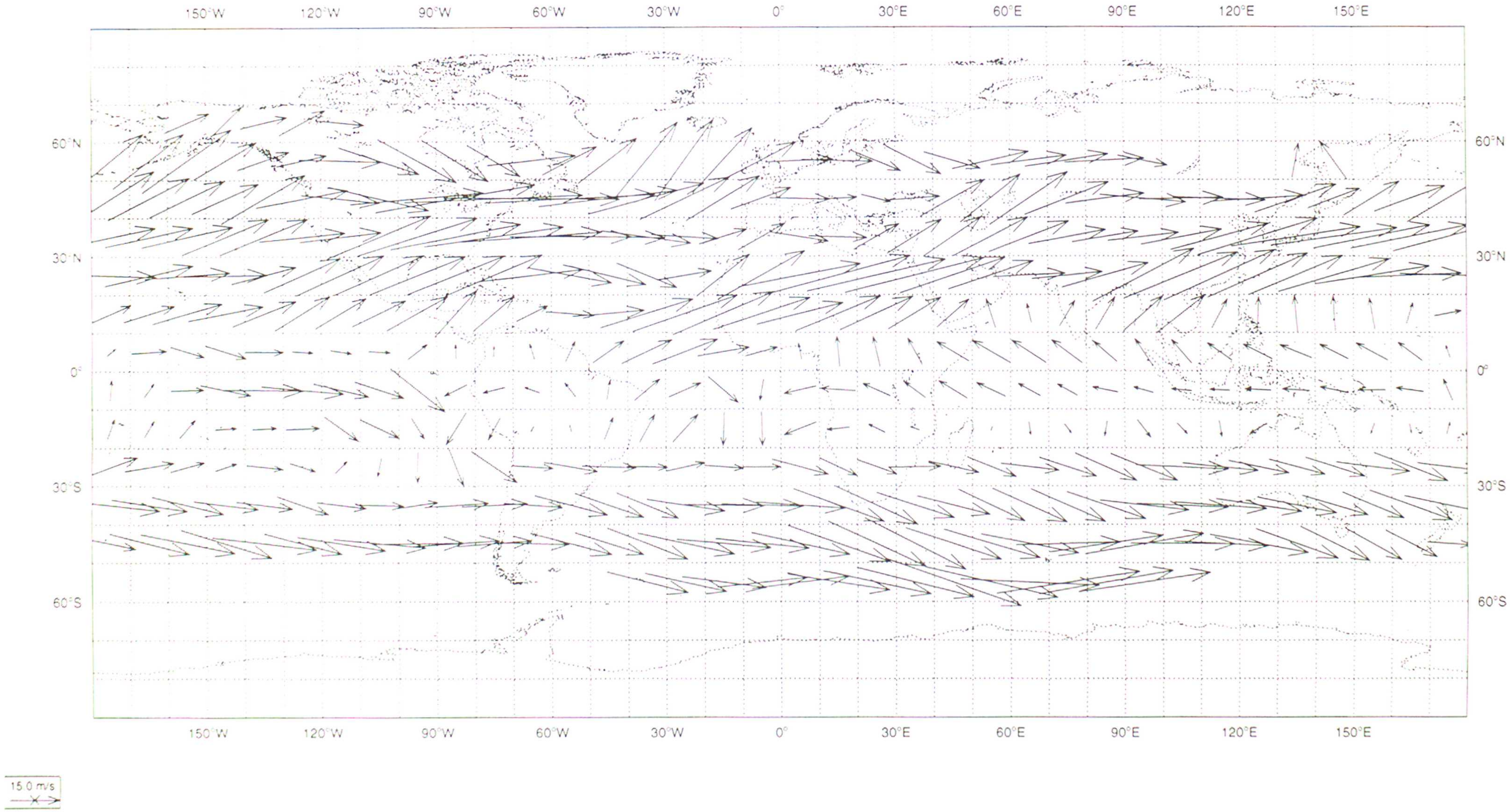

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0 m/s

Figure 22. SATOB 101 - 400 hPa vector wind differences. JANUARY 2002
All observations
Arrows are plotted where greater than 10 obs are present

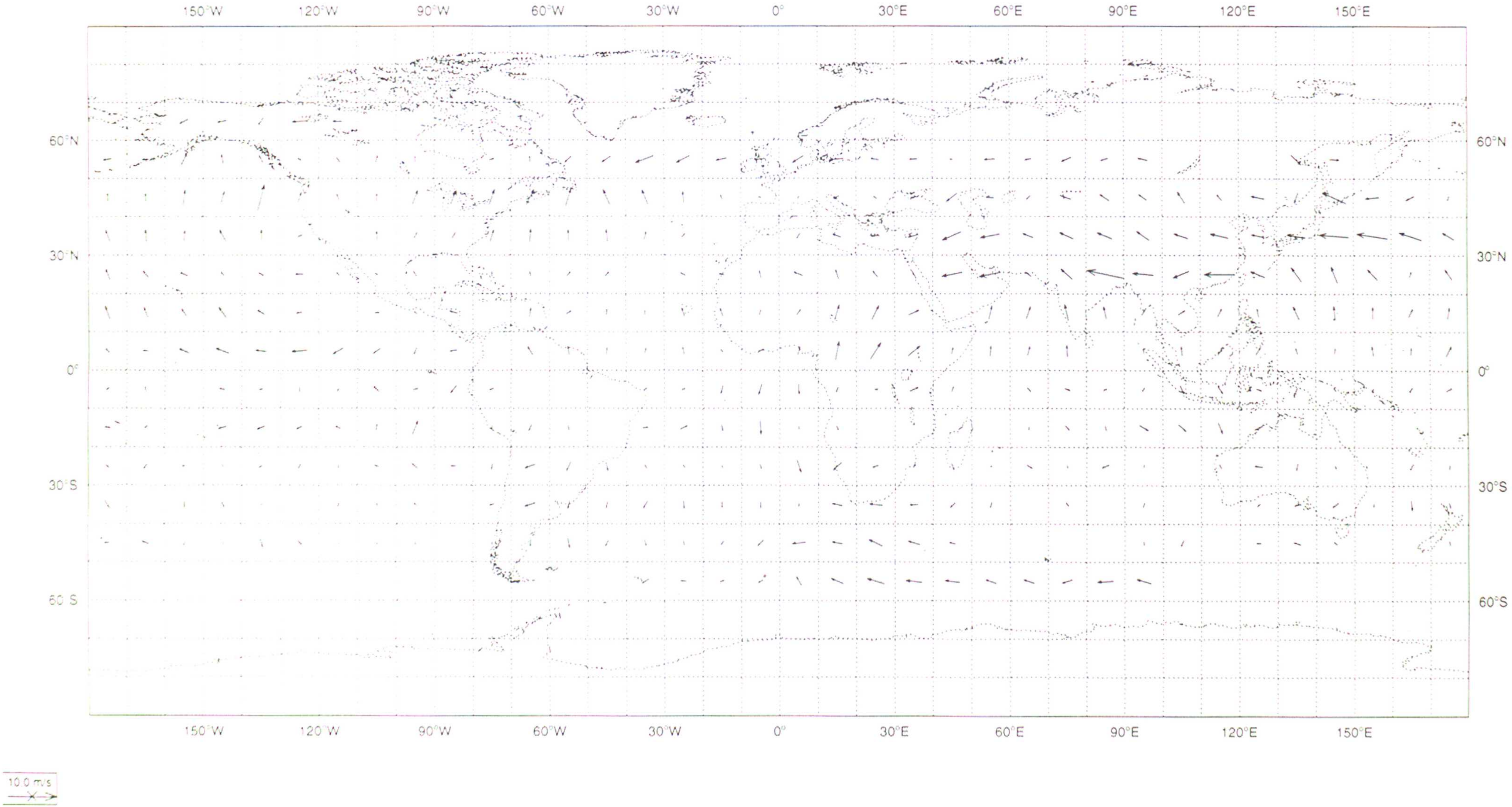

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0 m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). JANUARY 2002
All observations
Values are plotted where greater than 10 obs are present

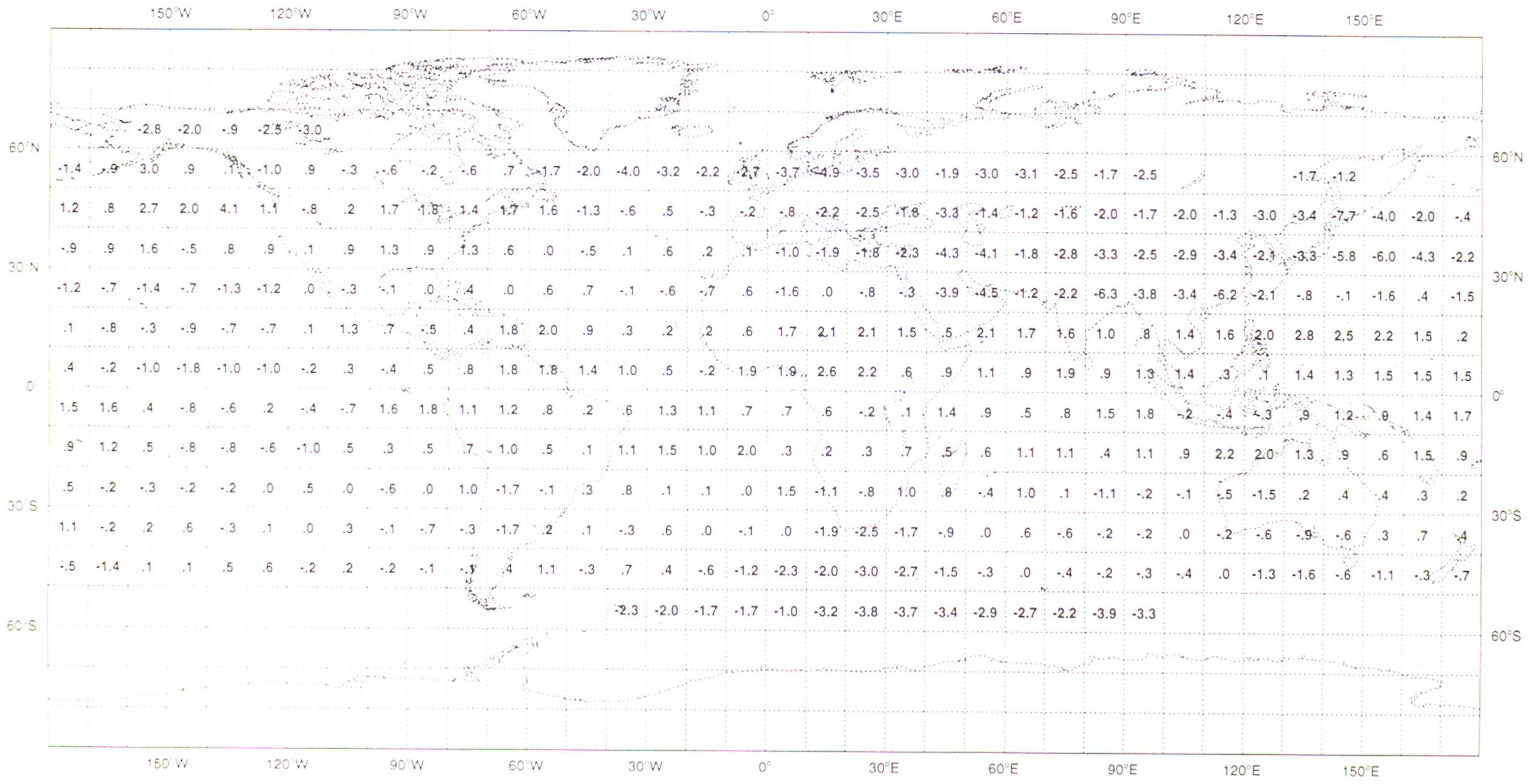
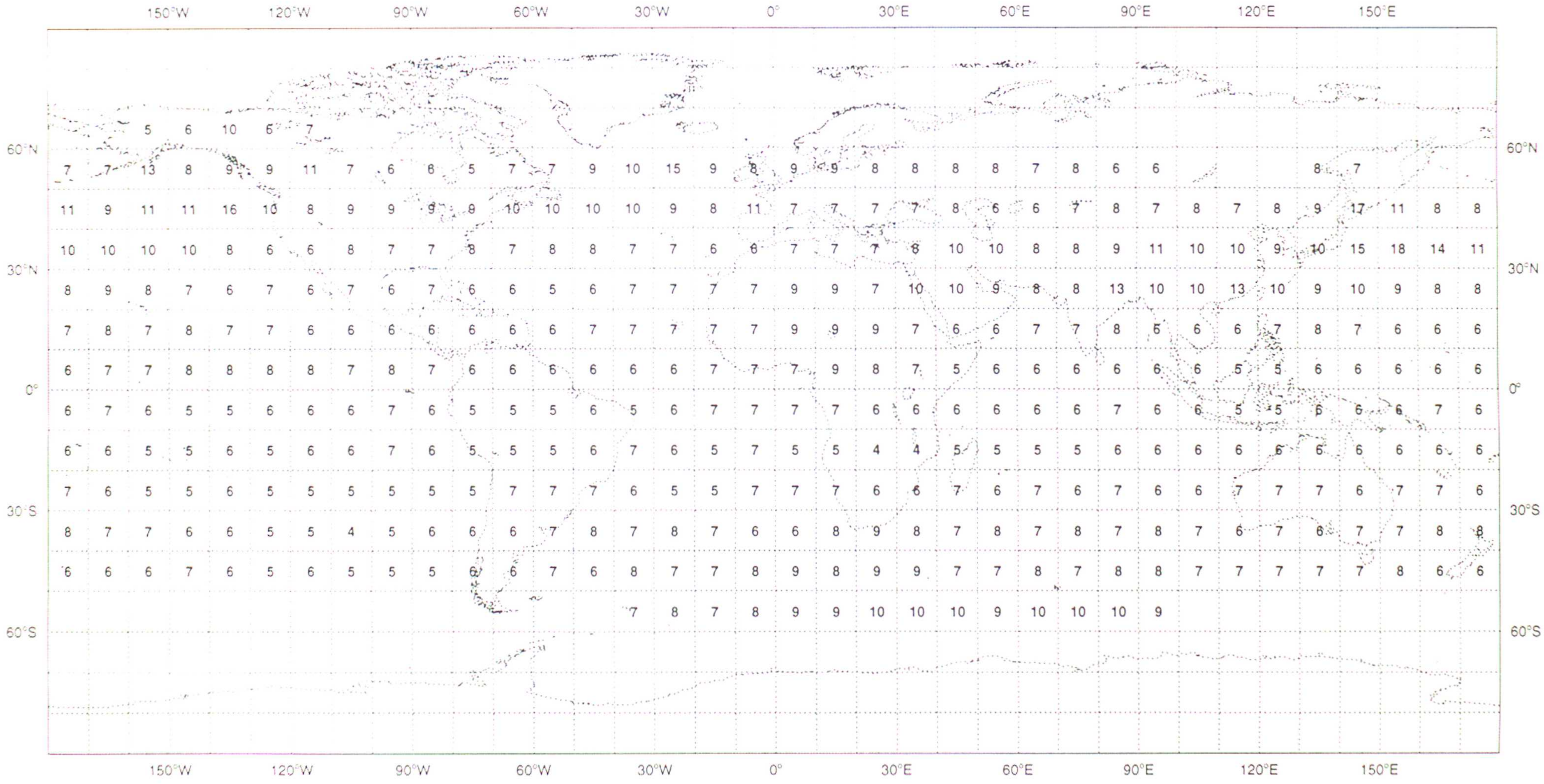

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-2.8 -2.0 -.9 -2.5 -3.0
-1.4 .9 3.0 .9 .1 -1.0 .9 -.3 -.6 -.2 -.6 .7 -1.7 -2.0 -4.0 -3.2 -2.2 -2.7 -3.7 -4.9 -3.5 -3.0 -1.9 -3.0 -3.1 -2.5 -1.7 -2.5 -1.7 -1.2
1.2 .8 2.7 2.0 4.1 1.1 -.8 .2 1.7 1.8 1.4 1.7 1.6 -1.3 -.6 .5 -.3 -.2 -.8 -2.2 -2.5 -1.8 -3.3 -1.4 -1.2 -1.6 -2.0 -1.7 -2.0 -1.3 -3.0 -3.4 -7.7 -4.0 -2.0 -.4
-.9 .9 1.6 -.5 .8 .9 .1 .9 1.3 .9 1.3 .6 .0 -.5 .1 .6 .2 .1 -1.0 -1.9 -1.8 -2.3 -4.3 -4.1 -1.8 -2.8 -3.3 -2.5 -2.9 -3.4 -2.1 -3.3 -5.8 -6.0 -4.3 -2.2
-1.2 -.7 -1.4 -.7 -1.3 -1.2 .0 -.3 -.1 .0 .4 .0 .6 .7 -.1 -.6 -.7 .6 -1.6 .0 -.8 -.3 -3.9 -4.5 -1.2 -2.2 -6.3 -3.8 -3.4 -6.2 -2.1 -.8 -.1 -1.6 .4 -1.5
.1 -.8 -.3 -.9 -.7 -.7 .1 1.3 .7 -.5 .4 1.8 2.0 .9 .3 .2 .2 .6 1.7 2.1 2.1 1.5 .5 2.1 1.7 1.6 1.0 .8 1.4 1.6 2.0 2.8 2.5 2.2 1.5 .2
.4 -.2 -1.0 -1.8 -1.0 -1.0 -.2 .3 -.4 .5 .8 1.8 1.8 1.4 1.0 .5 -.2 1.9 1.9 2.6 2.2 .6 .9 1.1 .9 1.9 .9 1.3 1.4 .3 .1 1.4 1.3 1.5 1.5 1.5
1.5 1.6 .4 -.8 -.6 .2 -.4 -.7 1.6 1.8 1.1 1.2 .8 .2 .6 1.3 1.1 .7 .7 .6 -.2 .1 1.4 .9 .5 .8 1.5 1.8 -.2 -.4 -.3 .9 1.2 .9 1.4 1.7
.9 1.2 .5 -.8 -.8 -.6 -1.0 .5 .3 .5 .7 1.0 .5 .1 1.1 1.5 1.0 2.0 .3 .2 .3 .7 .5 .6 1.1 1.1 .4 1.1 .9 2.2 2.0 1.3 .9 .6 1.5 .9
.5 -.2 -.3 -.2 -.2 .0 .5 .0 -.6 .0 1.0 -1.7 -.1 .3 .8 .1 .1 .0 1.5 -1.1 -.8 1.0 .8 -.4 1.0 .1 -1.1 -.2 -.1 .5 -1.5 .2 .4 .4 .3 .2
1.1 -.2 .2 .6 -.3 .1 .0 .3 -.1 -.7 -.3 -1.7 .2 .1 -.3 .6 .0 -.1 .0 -1.9 -2.5 -1.7 -.9 .0 .6 -.6 -.2 -.2 .0 -.2 -.6 -.9 -.6 .3 .7 .4
-.5 -1.4 .1 .1 .5 .6 -.2 .2 -.2 -.1 -.1 .4 1.1 -.3 .7 .4 -.6 -1.2 -2.3 -2.0 -3.0 -2.7 -1.5 -.3 .0 -.4 -.2 -.3 -.4 .0 -1.3 -1.6 -.6 -1.1 -.3 -.7
-2.3 -2.0 -1.7 -1.7 -1.0 -3.2 -3.8 -3.7 -3.4 -2.9 -2.7 -2.2 -3.9 -3.3

Figure 24. SATOB 101 - 400 hPa RMS O-B vector differences (ms-1). JANUARY 2002

All observations

Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
5 6 10 6 7
7 7 13 8 9 9 11 7 6 6 5 7 7 9 10 15 9 8 9 9 8 8 8 8 7 8 6 6 8 7
11 9 11 11 16 10 8 9 9 9 9 10 10 10 10 9 8 11 7 7 7 7 8 6 6 7 8 7 8 7 8 9 17 11 8 8
10 10 10 10 8 6 6 8 7 7 8 7 8 8 7 7 6 6 7 7 7 8 10 10 8 8 9 11 10 10 9 10 15 18 14 11
8 9 8 7 6 7 6 7 6 7 6 6 5 6 7 7 7 7 9 9 7 10 10 9 8 8 13 10 10 13 10 9 10 9 8 8
7 8 7 8 7 7 6 6 6 6 6 6 6 7 7 7 7 7 9 9 9 7 6 6 7 7 8 5 6 6 7 8 7 6 6 6
6 7 7 8 8 8 8 7 8 7 6 6 6 6 6 6 7 7 7 9 8 7 5 6 6 6 6 6 6 5 5 6 6 6 6 6
6 7 6 5 5 6 6 6 7 6 5 5 5 6 5 6 7 7 7 7 6 6 6 6 6 6 7 6 6 5 5 6 6 6 7 6
6 6 5 5 6 5 6 6 7 6 5 5 5 6 7 6 5 7 5 5 4 4 5 5 5 5 6 6 6 6 6 6 6 6 6 6
7 6 5 5 6 5 5 5 5 5 5 7 7 7 6 5 5 7 7 7 6 6 7 6 7 6 7 6 6 7 7 7 6 7 7 6
8 7 7 6 6 5 5 4 5 6 6 6 7 8 7 8 7 6 6 8 9 8 7 8 7 8 7 8 7 6 7 6 7 7 8 8
6 6 6 7 6 5 6 5 5 5 6 6 7 6 8 7 7 8 9 8 9 9 7 7 8 7 8 8 7 7 7 7 7 8 6 6
7 8 7 8 9 9 10 10 10 9 10 10 10 9

MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: BRACKNELL

MONTH: January 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15 and NOAA-16.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

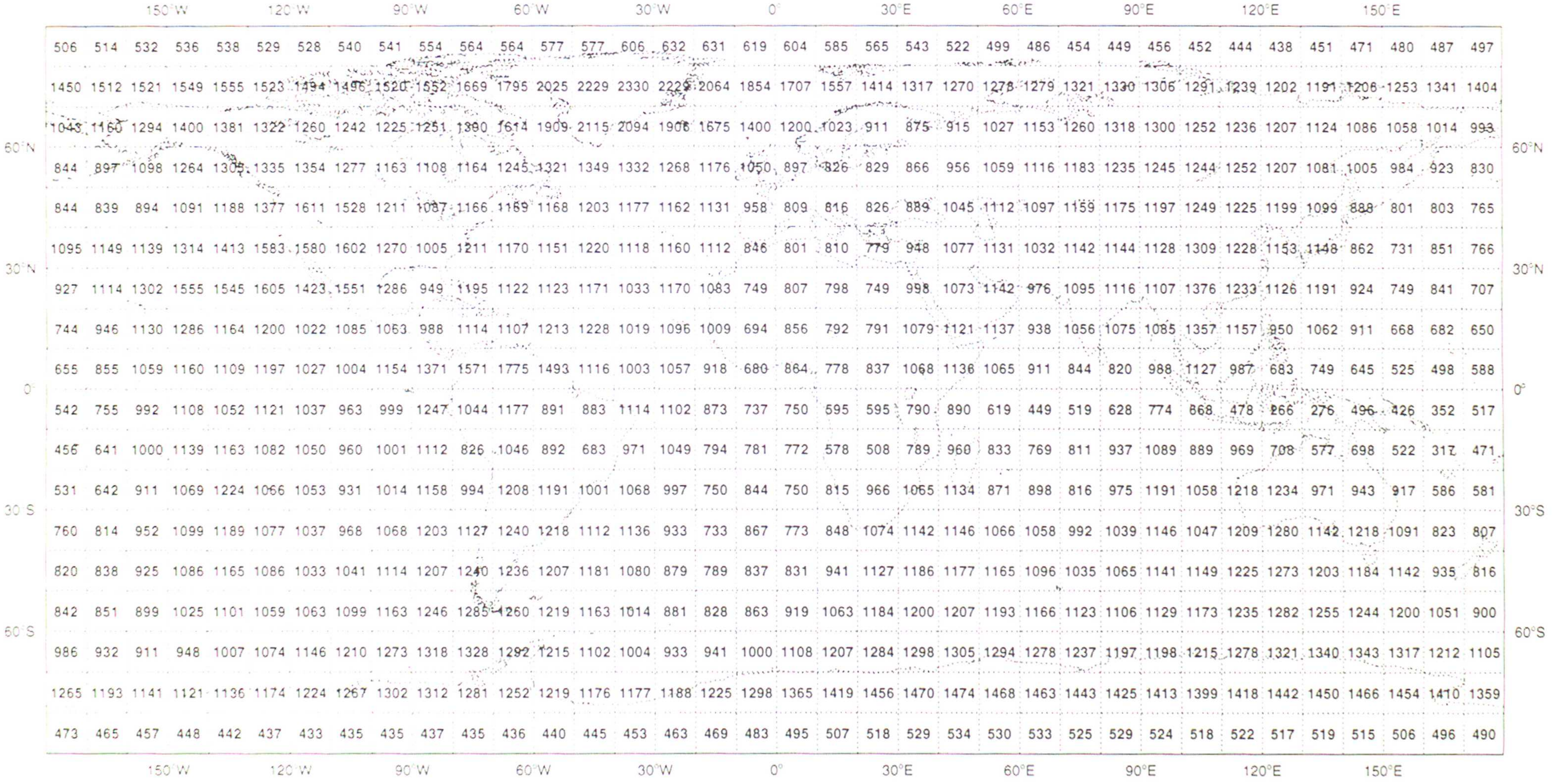
- HIRS8 (Surface)
- HIRS15 (700)
- HIRS11 (500-700)
- HIRS4 (400)
- AMSUA5 (700)
- AMSUA7 (300)
- AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. JANUARY 2002

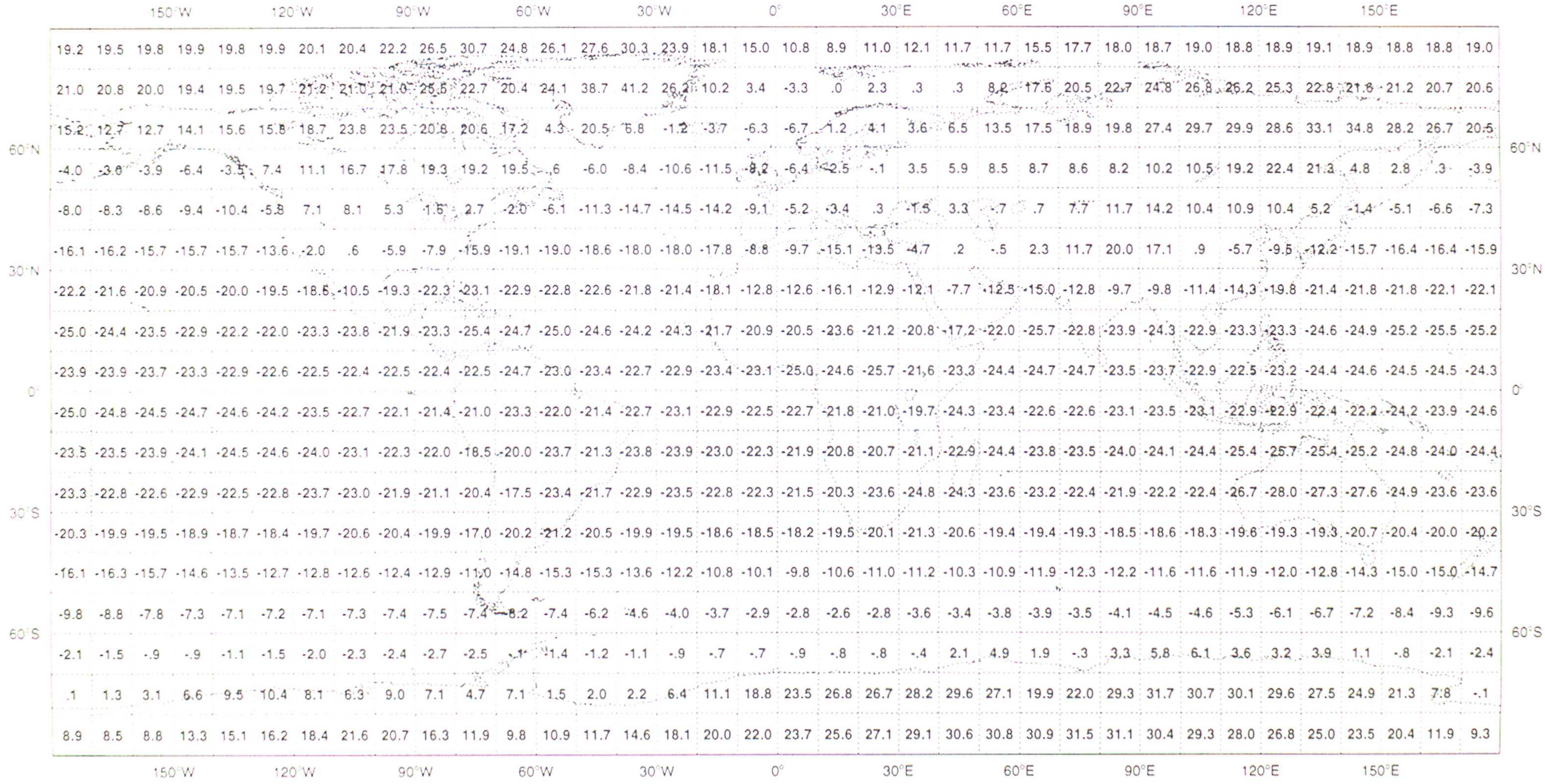
NOAA15, using all observations

Global average number of observations in 24 hours = 666888



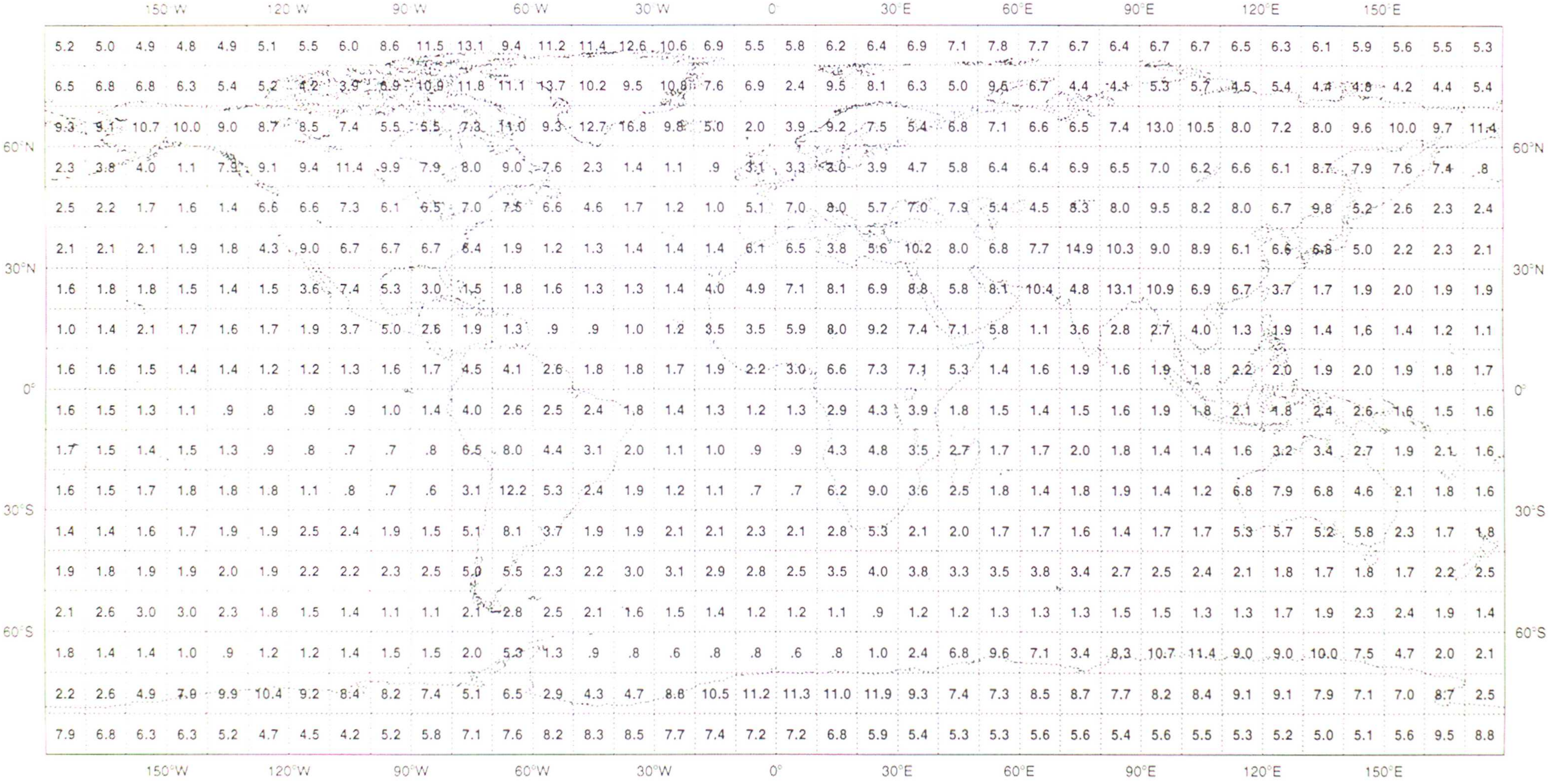
506	514	532	536	538	529	528	540	541	554	564	564	577	577	606	632	631	619	604	585	565	543	522	499	486	454	449	456	452	444	438	451	471	480	487	497
1450	1512	1521	1549	1555	1523	1494	1496	1520	1552	1669	1795	2025	2229	2330	2229	2064	1854	1707	1557	1414	1317	1270	1278	1279	1321	1330	1306	1291	1239	1202	1191	1206	1253	1341	1404
1043	1160	1294	1400	1381	1322	1260	1242	1225	1251	1390	1614	1909	2115	2094	1906	1675	1400	1200	1023	911	875	915	1027	1153	1260	1318	1300	1252	1236	1207	1124	1086	1058	1014	993
844	897	1098	1264	1305	1335	1354	1277	1163	1108	1164	1245	1321	1349	1332	1268	1176	1050	897	826	829	866	956	1059	1116	1183	1235	1245	1244	1252	1207	1081	1005	984	923	830
844	839	894	1091	1188	1377	1611	1528	1211	1087	1166	1169	1168	1203	1177	1162	1131	958	809	816	826	889	1045	1112	1097	1159	1175	1197	1249	1225	1199	1099	888	801	803	765
1095	1149	1139	1314	1413	1583	1580	1602	1270	1005	1211	1170	1151	1220	1118	1160	1112	846	801	810	779	948	1077	1131	1032	1142	1144	1128	1309	1228	1153	1148	862	731	851	766
927	1114	1302	1555	1545	1605	1423	1551	1286	949	1195	1122	1123	1171	1033	1170	1083	749	807	798	749	998	1073	1142	976	1095	1116	1107	1376	1233	1126	1191	924	749	841	707
744	946	1130	1286	1164	1200	1022	1085	1063	988	1114	1107	1213	1228	1019	1096	1009	694	856	792	791	1079	1121	1137	938	1056	1075	1085	1357	1157	950	1062	911	668	682	650
655	855	1059	1160	1109	1197	1027	1004	1154	1371	1571	1775	1493	1116	1003	1057	918	680	864	778	837	1068	1136	1065	911	844	820	988	1127	987	683	749	645	525	498	588
542	755	992	1108	1052	1121	1037	963	999	1247	1044	1177	891	883	1114	1102	873	737	750	595	595	790	890	619	449	519	628	774	868	478	266	276	496	426	352	517
456	641	1000	1139	1163	1082	1050	960	1001	1112	826	1046	892	683	971	1049	794	781	772	578	508	789	960	833	769	811	937	1089	889	969	708	577	698	522	317	471
531	642	911	1069	1224	1066	1053	931	1014	1158	994	1208	1191	1001	1068	997	750	844	750	815	966	1065	1134	871	898	816	975	1191	1058	1218	1234	971	943	917	586	581
760	814	952	1099	1189	1077	1037	968	1068	1203	1127	1240	1218	1112	1136	933	733	867	773	848	1074	1142	1146	1066	1058	992	1039	1146	1047	1209	1280	1142	1218	1091	823	807
820	838	925	1086	1165	1086	1033	1041	1114	1207	1240	1236	1207	1181	1080	879	789	837	831	941	1127	1186	1177	1165	1096	1035	1065	1141	1149	1225	1273	1203	1184	1142	935	816
842	851	899	1025	1101	1059	1063	1099	1163	1246	1285	1260	1219	1163	1014	881	828	863	919	1063	1184	1200	1207	1193	1166	1123	1106	1129	1173	1235	1282	1255	1244	1200	1051	900
986	932	911	948	1007	1074	1146	1210	1273	1318	1328	1292	1215	1102	1004	933	941	1000	1108	1207	1284	1298	1305	1294	1278	1237	1197	1198	1215	1278	1321	1340	1343	1317	1212	1105
1265	1193	1141	1121	1136	1174	1224	1267	1302	1312	1281	1252	1219	1176	1177	1188	1225	1298	1365	1419	1456	1470	1474	1468	1463	1443	1425	1413	1399	1418	1442	1450	1466	1454	1410	1359
473	465	457	448	442	437	433	435	435	437	435	436	440	445	453	463	469	483	495	507	518	529	534	530	533	525	529	524	518	522	517	519	515	506	496	490

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



19.2	19.5	19.8	19.9	19.8	19.9	20.1	20.4	22.2	26.5	30.7	24.8	26.1	27.6	30.3	23.9	18.1	15.0	10.8	8.9	11.0	12.1	11.7	11.7	15.5	17.7	18.0	18.7	19.0	18.8	18.9	19.1	18.9	18.8	18.8	19.0
21.0	20.8	20.0	19.4	19.5	19.7	21.2	21.0	21.0	25.5	22.7	20.4	24.1	38.7	41.2	26.2	10.2	3.4	-3.3	.0	2.3	.3	.3	8.2	17.6	20.5	22.7	24.8	26.8	26.2	25.3	22.8	21.6	21.2	20.7	20.6
15.2	12.7	12.7	14.1	15.6	15.8	18.7	23.8	23.5	20.8	20.6	17.2	4.3	20.5	5.8	-1.2	-3.7	-6.3	-6.7	-1.2	4.1	3.6	6.5	13.5	17.5	18.9	19.8	27.4	29.7	29.9	28.6	33.1	34.8	28.2	26.7	20.5
-4.0	-3.6	-3.9	-6.4	-3.5	7.4	11.1	16.7	17.8	19.3	19.2	19.5	.6	-6.0	-8.4	-10.6	-11.5	-8.2	-6.4	-2.5	-.1	3.5	5.9	8.5	8.7	8.6	8.2	10.2	10.5	19.2	22.4	21.3	4.8	2.8	.3	-3.9
-8.0	-8.3	-8.6	-9.4	-10.4	-5.8	7.1	8.1	5.3	1.6	2.7	-2.0	-6.1	-11.3	-14.7	-14.5	-14.2	-9.1	-5.2	-3.4	.3	-1.5	3.3	-.7	.7	7.7	11.7	14.2	10.4	10.9	10.4	5.2	-1.4	-5.1	-6.6	-7.3
-16.1	-16.2	-15.7	-15.7	-15.7	-13.6	-2.0	.6	-5.9	-7.9	-15.9	-19.1	-19.0	-18.6	-18.0	-18.0	-17.8	-8.8	-9.7	-15.1	-13.5	-4.7	.2	-.5	2.3	11.7	20.0	17.1	.9	-5.7	-9.5	-12.2	-15.7	-16.4	-16.4	-15.9
-22.2	-21.6	-20.9	-20.5	-20.0	-19.5	-18.5	-10.5	-19.3	-22.3	-23.1	-22.9	-22.8	-22.6	-21.8	-21.4	-18.1	-12.8	-12.6	-16.1	-12.9	-12.1	-7.7	-12.5	-15.0	-12.8	-9.7	-9.8	-11.4	-14.3	-19.8	-21.4	-21.8	-21.8	-22.1	-22.1
-25.0	-24.4	-23.5	-22.9	-22.2	-22.0	-23.3	-23.8	-21.9	-23.3	-25.4	-24.7	-25.0	-24.6	-24.2	-24.3	-21.7	-20.9	-20.5	-23.6	-21.2	-20.8	-17.2	-22.0	-25.7	-22.8	-23.9	-24.3	-22.9	-23.3	-23.3	-24.6	-24.9	-25.2	-25.5	-25.2
-23.9	-23.9	-23.7	-23.3	-22.9	-22.6	-22.5	-22.4	-22.5	-22.4	-22.5	-24.7	-23.0	-23.4	-22.7	-22.9	-23.4	-23.1	-25.0	-24.6	-25.7	-21.6	-23.3	-24.4	-24.7	-24.7	-23.5	-23.7	-22.9	-22.5	-23.2	-24.4	-24.6	-24.5	-24.5	-24.3
-25.0	-24.8	-24.5	-24.7	-24.6	-24.2	-23.5	-22.7	-22.1	-21.4	-21.0	-23.3	-22.0	-21.4	-22.7	-23.1	-22.9	-22.5	-22.7	-21.8	-21.0	-19.7	-24.3	-23.4	-22.6	-22.6	-23.1	-23.5	-23.1	-22.9	-22.9	-22.4	-22.2	-24.2	-23.9	-24.6
-23.5	-23.5	-23.9	-24.1	-24.5	-24.6	-24.0	-23.1	-22.3	-22.0	-18.5	-20.0	-23.7	-21.3	-23.8	-23.9	-23.0	-22.3	-21.9	-20.8	-20.7	-21.1	-22.9	-24.4	-23.8	-23.5	-24.0	-24.1	-24.4	-25.4	-25.7	-25.4	-25.2	-24.8	-24.0	-24.4
-23.3	-22.8	-22.6	-22.9	-22.5	-22.8	-23.7	-23.0	-21.9	-21.1	-20.4	-17.5	-23.4	-21.7	-22.9	-23.5	-22.8	-22.3	-21.5	-20.3	-23.6	-24.8	-24.3	-23.6	-23.2	-22.4	-21.9	-22.2	-22.4	-26.7	-28.0	-27.3	-27.6	-24.9	-23.6	-23.6
-20.3	-19.9	-19.5	-18.9	-18.7	-18.4	-19.7	-20.6	-20.4	-19.9	-17.0	-20.2	-21.2	-20.5	-19.9	-19.5	-18.6	-18.5	-18.2	-19.5	-20.1	-21.3	-20.6	-19.4	-19.4	-19.3	-18.5	-18.6	-18.3	-19.6	-19.3	-19.3	-20.7	-20.4	-20.0	-20.2
-16.1	-16.3	-15.7	-14.6	-13.5	-12.7	-12.8	-12.6	-12.4	-12.9	-11.0	-14.8	-15.3	-15.3	-13.6	-12.2	-10.8	-10.1	-9.8	-10.6	-11.0	-11.2	-10.3	-10.9	-11.9	-12.3	-12.2	-11.6	-11.6	-11.9	-12.0	-12.8	-14.3	-15.0	-15.0	-14.7
-9.8	-8.8	-7.8	-7.3	-7.1	-7.2	-7.1	-7.3	-7.4	-7.5	-7.4	-8.2	-7.4	-6.2	-4.6	-4.0	-3.7	-2.9	-2.8	-2.6	-2.8	-3.6	-3.4	-3.8	-3.9	-3.5	-4.1	-4.5	-4.6	-5.3	-6.1	-6.7	-7.2	-8.4	-9.3	-9.6
-2.1	-1.5	-.9	-.9	-1.1	-1.5	-2.0	-2.3	-2.4	-2.7	-2.5	-.1	-1.4	-1.2	-1.1	-.9	-.7	-.7	-.9	-.8	-.8	-.4	2.1	4.9	1.9	-.3	3.3	5.8	6.1	3.6	3.2	3.9	1.1	-.8	-2.1	-2.4
.1	1.3	3.1	6.6	9.5	10.4	8.1	6.3	9.0	7.1	4.7	7.1	1.5	2.0	2.2	6.4	11.1	18.8	23.5	26.8	26.7	28.2	29.6	27.1	19.9	22.0	29.3	31.7	30.7	30.1	29.6	27.5	24.9	21.3	7.8	-.1
8.9	8.5	8.8	13.3	15.1	16.2	18.4	21.6	20.7	16.3	11.9	9.8	10.9	11.7	14.6	18.1	20.0	22.0	23.7	25.6	27.1	29.1	30.6	30.8	30.9	31.5	31.1	30.4	29.3	28.0	26.8	25.0	23.5	20.4	11.9	9.3

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations

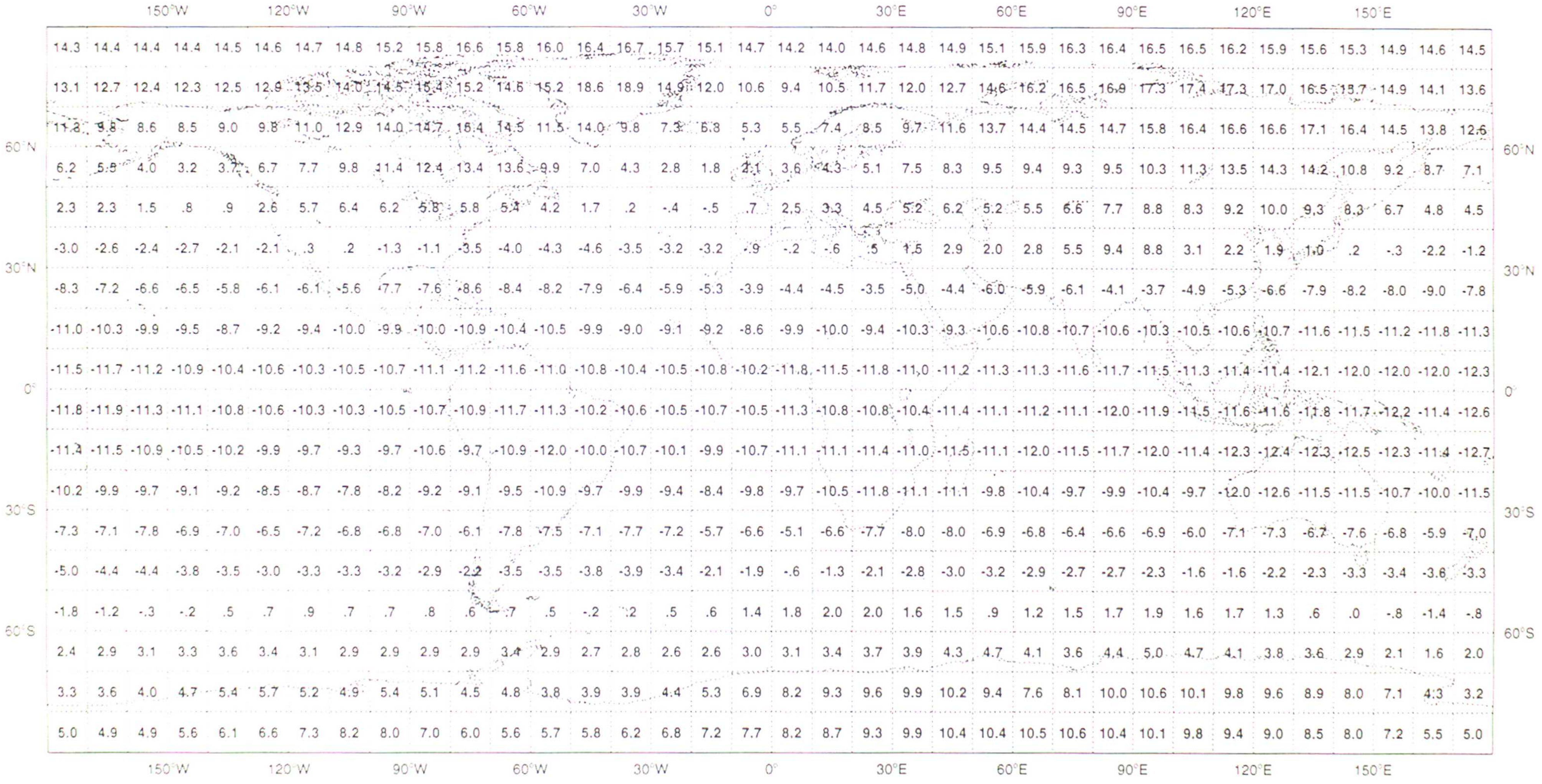


5.2	5.0	4.9	4.8	4.9	5.1	5.5	6.0	8.6	11.5	13.1	9.4	11.2	11.4	12.6	10.6	6.9	5.5	5.8	6.2	6.4	6.9	7.1	7.8	7.7	6.7	6.4	6.7	6.7	6.5	6.3	6.1	5.9	5.6	5.5	5.3
6.5	6.8	6.8	6.3	5.4	5.2	4.2	3.9	6.9	10.9	11.8	11.1	13.7	10.2	9.5	10.8	7.6	6.9	2.4	9.5	8.1	6.3	5.0	9.6	6.7	4.4	4.1	5.3	5.7	4.5	5.4	4.4	4.8	4.2	4.4	5.4
9.3	9.1	10.7	10.0	9.0	8.7	8.5	7.4	5.5	5.5	7.3	11.0	9.3	12.7	16.8	9.8	5.0	2.0	3.9	9.2	7.5	5.4	6.8	7.1	6.6	6.5	7.4	13.0	10.5	8.0	7.2	8.0	9.6	10.0	9.7	11.4
2.3	3.8	4.0	1.1	7.9	9.1	9.4	11.4	9.9	7.9	8.0	9.0	7.6	2.3	1.4	1.1	.9	3.1	3.3	3.0	3.9	4.7	5.8	6.4	6.4	6.9	6.5	7.0	6.2	6.6	6.1	8.7	7.9	7.6	7.4	.8
2.5	2.2	1.7	1.6	1.4	6.6	6.6	7.3	6.1	6.5	7.0	7.5	6.6	4.6	1.7	1.2	1.0	5.1	7.0	8.0	5.7	7.0	7.9	5.4	4.5	8.3	8.0	9.5	8.2	8.0	6.7	9.8	5.2	2.6	2.3	2.4
2.1	2.1	2.1	1.9	1.8	4.3	9.0	6.7	6.7	6.7	6.4	1.9	1.2	1.3	1.4	1.4	1.4	6.1	6.5	3.8	5.6	10.2	8.0	6.8	7.7	14.9	10.3	9.0	8.9	6.1	6.6	6.8	5.0	2.2	2.3	2.1
1.6	1.8	1.8	1.5	1.4	1.5	3.6	7.4	5.3	3.0	1.5	1.8	1.6	1.3	1.3	1.4	4.0	4.9	7.1	8.1	6.9	8.8	5.8	8.1	10.4	4.8	13.1	10.9	6.9	6.7	3.7	1.7	1.9	2.0	1.9	1.9
1.0	1.4	2.1	1.7	1.6	1.7	1.9	3.7	5.0	2.6	1.9	1.3	.9	.9	1.0	1.2	3.5	3.5	5.9	8.0	9.2	7.4	7.1	5.8	1.1	3.6	2.8	2.7	4.0	1.3	1.9	1.4	1.6	1.4	1.2	1.1
1.6	1.6	1.5	1.4	1.4	1.2	1.2	1.3	1.6	1.7	4.5	4.1	2.6	1.8	1.8	1.7	1.9	2.2	3.0	6.6	7.3	7.1	5.3	1.4	1.6	1.9	1.6	1.9	1.8	2.2	2.0	1.9	2.0	1.9	1.8	1.7
1.6	1.5	1.3	1.1	.9	.8	.9	.9	1.0	1.4	4.0	2.6	2.5	2.4	1.8	1.4	1.3	1.2	1.3	2.9	4.3	3.9	1.8	1.5	1.4	1.5	1.6	1.9	1.8	2.1	1.8	2.4	2.6	1.6	1.5	1.6
1.7	1.5	1.4	1.5	1.3	.9	.8	.7	.7	.8	6.5	8.0	4.4	3.1	2.0	1.1	1.0	.9	.9	4.3	4.8	3.5	2.7	1.7	1.7	2.0	1.8	1.4	1.4	1.6	3.2	3.4	2.7	1.9	2.1	1.6
1.6	1.5	1.7	1.8	1.8	1.8	1.1	.8	.7	.6	3.1	12.2	5.3	2.4	1.9	1.2	1.1	.7	.7	6.2	9.0	3.6	2.5	1.8	1.4	1.8	1.9	1.4	1.2	6.8	7.9	6.8	4.6	2.1	1.8	1.6
1.4	1.4	1.6	1.7	1.9	1.9	2.5	2.4	1.9	1.5	5.1	8.1	3.7	1.9	1.9	2.1	2.1	2.3	2.1	2.8	5.3	2.1	2.0	1.7	1.7	1.6	1.4	1.7	1.7	5.3	5.7	5.2	5.8	2.3	1.7	1.8
1.9	1.8	1.9	1.9	2.0	1.9	2.2	2.2	2.3	2.5	5.0	5.5	2.3	2.2	3.0	3.1	2.9	2.8	2.5	3.5	4.0	3.8	3.3	3.5	3.8	3.4	2.7	2.5	2.4	2.1	1.8	1.7	1.8	1.7	2.2	2.5
2.1	2.6	3.0	3.0	2.3	1.8	1.5	1.4	1.1	1.1	2.1	2.8	2.5	2.1	1.6	1.5	1.4	1.2	1.2	1.1	.9	1.2	1.2	1.3	1.3	1.3	1.5	1.5	1.3	1.3	1.7	1.9	2.3	2.4	1.9	1.4
1.8	1.4	1.4	1.0	.9	1.2	1.2	1.4	1.5	1.5	2.0	5.3	1.3	.9	.8	.6	.8	.8	.6	.8	1.0	2.4	6.8	9.6	7.1	3.4	8.3	10.7	11.4	9.0	9.0	10.0	7.5	4.7	2.0	2.1
2.2	2.6	4.9	7.8	9.9	10.4	9.2	8.4	8.2	7.4	5.1	6.5	2.9	4.3	4.7	8.8	10.5	11.2	11.3	11.0	11.9	9.3	7.4	7.3	8.5	8.7	7.7	8.2	8.4	9.1	9.1	7.9	7.1	7.0	8.7	2.5
7.9	6.8	6.3	6.3	5.2	4.7	4.5	4.2	5.2	5.8	7.1	7.6	8.2	8.3	8.5	7.7	7.4	7.2	7.2	6.8	5.9	5.4	5.3	5.3	5.6	5.6	5.4	5.6	5.5	5.3	5.2	5.0	5.1	5.6	9.5	8.8

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002

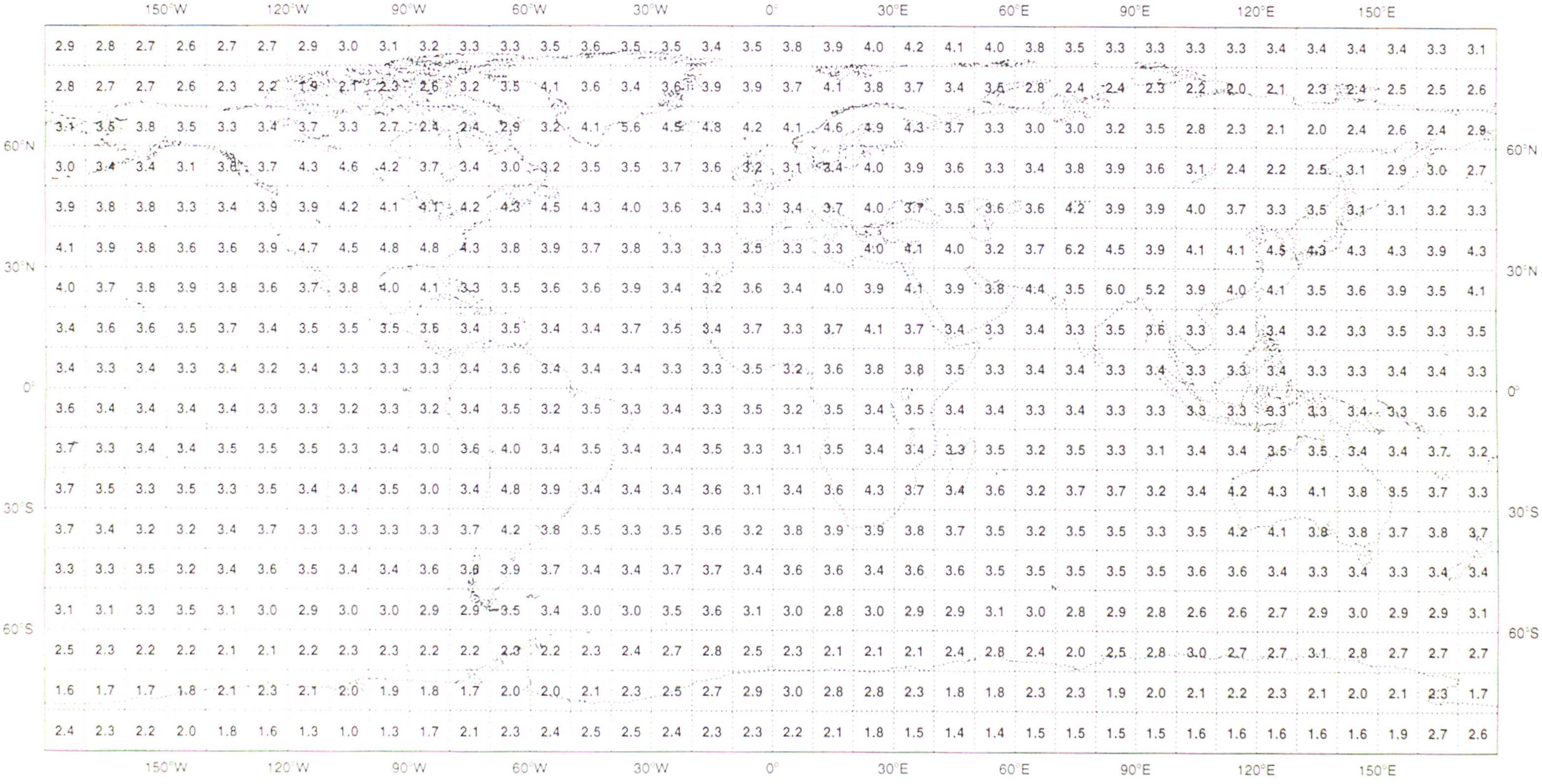
Channel: HIRS15 (700 hPa)

NOAA15, using all observations



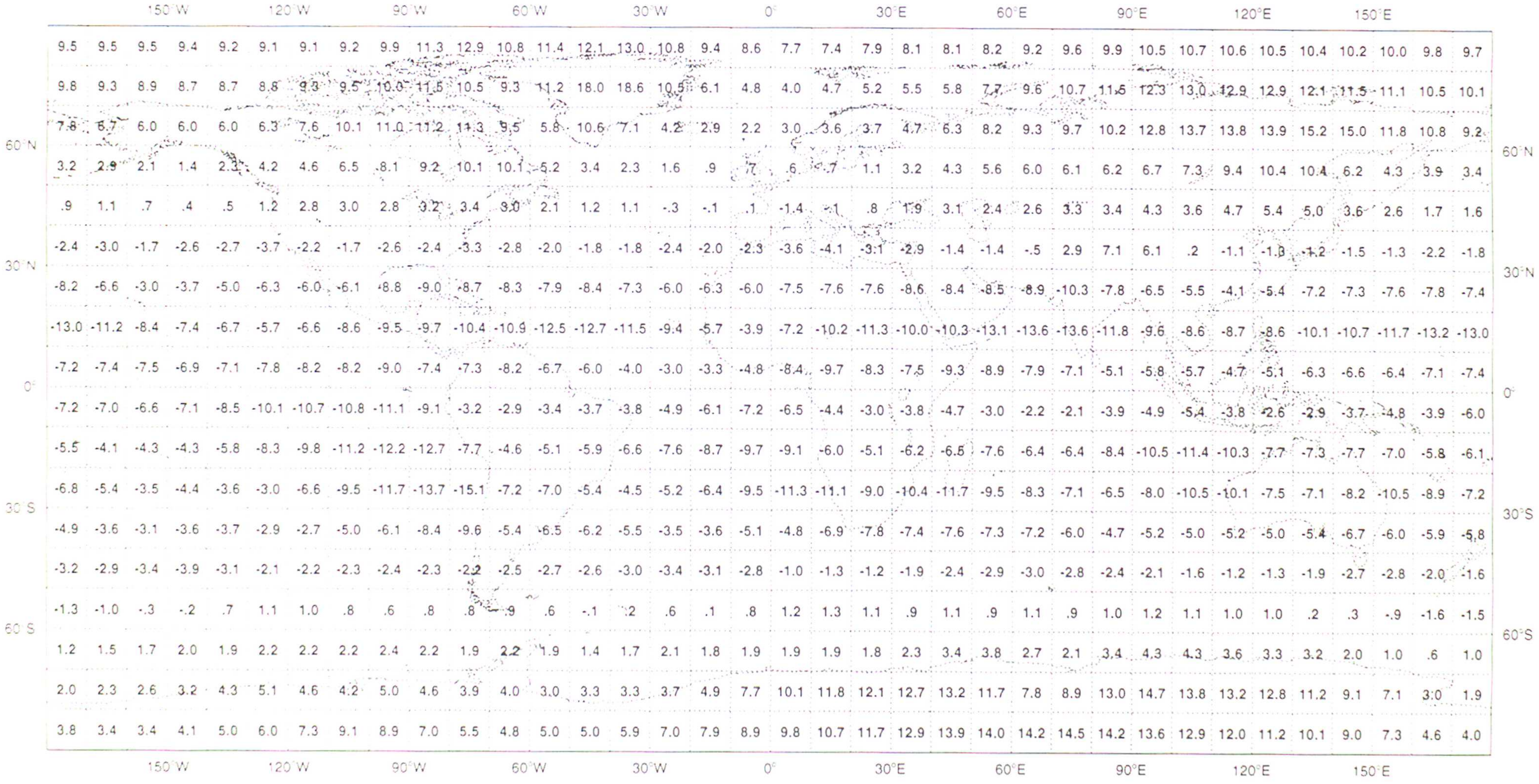
14.3	14.4	14.4	14.4	14.5	14.6	14.7	14.8	15.2	15.8	16.6	15.8	16.0	16.4	16.7	15.7	15.1	14.7	14.2	14.0	14.6	14.8	14.9	15.1	15.9	16.3	16.4	16.5	16.5	16.2	15.9	15.6	15.3	14.9	14.6	14.5
13.1	12.7	12.4	12.3	12.5	12.9	13.5	14.0	14.5	15.4	15.2	14.6	15.2	18.6	18.9	14.9	12.0	10.6	9.4	10.5	11.7	12.0	12.7	14.6	16.2	16.5	16.9	17.3	17.4	17.3	17.0	16.5	15.7	14.9	14.1	13.6
11.8	9.8	8.6	8.5	9.0	9.8	11.0	12.9	14.0	14.7	16.4	14.5	11.5	14.0	9.8	7.3	6.8	5.3	5.5	7.4	8.5	9.7	11.6	13.7	14.4	14.5	14.7	15.8	16.4	16.6	16.6	17.1	16.4	14.5	13.8	12.6
6.2	5.8	4.0	3.2	3.7	6.7	7.7	9.8	11.4	12.4	13.4	13.6	9.9	7.0	4.3	2.8	1.8	2.1	3.6	4.3	5.1	7.5	8.3	9.5	9.4	9.3	9.5	10.3	11.3	13.5	14.3	14.2	10.8	9.2	8.7	7.1
2.3	2.3	1.5	.8	.9	2.6	5.7	6.4	6.2	5.8	5.8	5.4	4.2	1.7	.2	-.4	-.5	.7	2.5	3.3	4.5	5.2	6.2	5.2	5.5	6.6	7.7	8.8	8.3	9.2	10.0	9.3	8.3	6.7	4.8	4.5
-3.0	-2.6	-2.4	-2.7	-2.1	-2.1	.3	.2	-1.3	-1.1	-3.5	-4.0	-4.3	-4.6	-3.5	-3.2	-3.2	-.9	-.2	-.6	.5	1.5	2.9	2.0	2.8	5.5	9.4	8.8	3.1	2.2	1.9	1.0	.2	-.3	-2.2	-1.2
-8.3	-7.2	-6.6	-6.5	-5.8	-6.1	-6.1	-5.6	-7.7	-7.6	-8.6	-8.4	-8.2	-7.9	-6.4	-5.9	-5.3	-3.9	-4.4	-4.5	-3.5	-5.0	-4.4	-6.0	-5.9	-6.1	-4.1	-3.7	-4.9	-5.3	-6.6	-7.9	-8.2	-8.0	-9.0	-7.8
-11.0	-10.3	-9.9	-9.5	-8.7	-9.2	-9.4	-10.0	-9.9	-10.0	-10.9	-10.4	-10.5	-9.9	-9.0	-9.1	-9.2	-8.6	-9.9	-10.0	-9.4	-10.3	-9.3	-10.6	-10.8	-10.7	-10.6	-10.3	-10.5	-10.6	-10.7	-11.6	-11.5	-11.2	-11.8	-11.3
-11.5	-11.7	-11.2	-10.9	-10.4	-10.6	-10.3	-10.5	-10.7	-11.1	-11.2	-11.6	-11.0	-10.8	-10.4	-10.5	-10.8	-10.2	-11.8	-11.5	-11.8	-11.0	-11.2	-11.3	-11.3	-11.6	-11.7	-11.5	-11.3	-11.4	-11.4	-12.1	-12.0	-12.0	-12.0	-12.3
-11.8	-11.9	-11.3	-11.1	-10.8	-10.6	-10.3	-10.3	-10.5	-10.7	-10.9	-11.7	-11.3	-10.2	-10.6	-10.5	-10.7	-10.5	-11.3	-10.8	-10.8	-10.4	-11.4	-11.1	-11.2	-11.1	-12.0	-11.9	-11.5	-11.6	-11.6	-11.8	-11.7	-12.2	-11.4	-12.6
-11.4	-11.5	-10.9	-10.5	-10.2	-9.9	-9.7	-9.3	-9.7	-10.6	-9.7	-10.9	-12.0	-10.0	-10.7	-10.1	-9.9	-10.7	-11.1	-11.1	-11.4	-11.0	-11.5	-11.1	-12.0	-11.5	-11.7	-12.0	-11.4	-12.3	-12.4	-12.3	-12.5	-12.3	-11.4	-12.7
-10.2	-9.9	-9.7	-9.1	-9.2	-8.5	-8.7	-7.8	-8.2	-9.2	-9.1	-9.5	-10.9	-9.7	-9.9	-9.4	-8.4	-9.8	-9.7	-10.5	-11.8	-11.1	-11.1	-9.8	-10.4	-9.7	-9.9	-10.4	-9.7	-12.0	-12.6	-11.5	-11.5	-10.7	-10.0	-11.5
-7.3	-7.1	-7.8	-6.9	-7.0	-6.5	-7.2	-6.8	-6.8	-7.0	-6.1	-7.8	-7.5	-7.1	-7.7	-7.2	-5.7	-6.6	-5.1	-6.6	-7.7	-8.0	-8.0	-6.9	-6.8	-6.4	-6.6	-6.9	-6.0	-7.1	-7.3	-6.7	-7.6	-6.8	-5.9	-7.0
-5.0	-4.4	-4.4	-3.8	-3.5	-3.0	-3.3	-3.3	-3.2	-2.9	-2.2	-3.5	-3.5	-3.8	-3.9	-3.4	-2.1	-1.9	-.6	-1.3	-2.1	-2.8	-3.0	-3.2	-2.9	-2.7	-2.7	-2.3	-1.6	-1.6	-2.2	-2.3	-3.3	-3.4	-3.6	-3.3
-1.8	-1.2	-.3	-.2	.5	.7	.9	.7	.7	.8	.6	.7	.5	-.2	.2	.5	.6	1.4	1.8	2.0	2.0	1.6	1.5	.9	1.2	1.5	1.7	1.9	1.6	1.7	1.3	.6	.0	-.8	-1.4	-.8
2.4	2.9	3.1	3.3	3.6	3.4	3.1	2.9	2.9	2.9	2.9	3.4	2.9	2.7	2.8	2.6	2.6	3.0	3.1	3.4	3.7	3.9	4.3	4.7	4.1	3.6	4.4	5.0	4.7	4.1	3.8	3.6	2.9	2.1	1.6	2.0
3.3	3.6	4.0	4.7	5.4	5.7	5.2	4.9	5.4	5.1	4.5	4.8	3.8	3.9	3.9	4.4	5.3	6.9	8.2	9.3	9.6	9.9	10.2	9.4	7.6	8.1	10.0	10.6	10.1	9.8	9.6	8.9	8.0	7.1	4.3	3.2
5.0	4.9	4.9	5.6	6.1	6.6	7.3	8.2	8.0	7.0	6.0	5.6	5.7	5.8	6.2	6.8	7.2	7.7	8.2	8.7	9.3	9.9	10.4	10.4	10.5	10.6	10.4	10.1	9.8	9.4	9.0	8.5	8.0	7.2	5.5	5.0

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



2.9	2.8	2.7	2.6	2.7	2.7	2.9	3.0	3.1	3.2	3.3	3.3	3.5	3.6	3.5	3.5	3.4	3.5	3.8	3.9	4.0	4.2	4.1	4.0	3.8	3.5	3.3	3.3	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.1
2.8	2.7	2.7	2.6	2.3	2.2	1.9	2.1	2.3	2.6	3.2	3.5	4.1	3.6	3.4	3.6	3.9	3.9	3.7	4.1	3.8	3.7	3.4	3.6	2.8	2.4	2.4	2.3	2.2	2.0	2.1	2.3	2.4	2.5	2.5	2.6
3.1	3.5	3.8	3.5	3.3	3.4	3.7	3.3	2.7	2.4	2.4	2.9	3.2	4.1	5.6	4.5	4.8	4.2	4.1	4.6	4.9	4.3	3.7	3.3	3.0	3.0	3.2	3.5	2.8	2.3	2.1	2.0	2.4	2.6	2.4	2.9
3.0	3.4	3.4	3.1	3.8	3.7	4.3	4.6	4.2	3.7	3.4	3.0	3.2	3.5	3.5	3.7	3.6	3.2	3.1	3.4	4.0	3.9	3.6	3.3	3.4	3.8	3.9	3.6	3.1	2.4	2.2	2.5	3.1	2.9	3.0	2.7
3.9	3.8	3.8	3.3	3.4	3.9	3.9	4.2	4.1	4.1	4.2	4.3	4.5	4.3	4.0	3.6	3.4	3.3	3.4	3.7	4.0	3.7	3.5	3.6	3.6	4.2	3.9	3.9	4.0	3.7	3.3	3.5	3.1	3.1	3.2	3.3
4.1	3.9	3.8	3.6	3.6	3.9	4.7	4.5	4.8	4.8	4.3	3.8	3.9	3.7	3.8	3.3	3.3	3.5	3.3	3.3	4.0	4.1	4.0	3.2	3.7	6.2	4.5	3.9	4.1	4.1	4.5	4.3	4.3	4.3	3.9	4.3
4.0	3.7	3.8	3.9	3.8	3.6	3.7	3.8	4.0	4.1	3.3	3.5	3.6	3.6	3.9	3.4	3.2	3.6	3.4	4.0	3.9	4.1	3.9	3.8	4.4	3.5	6.0	5.2	3.9	4.0	4.1	3.5	3.6	3.9	3.5	4.1
3.4	3.6	3.6	3.5	3.7	3.4	3.5	3.5	3.5	3.6	3.4	3.5	3.4	3.4	3.7	3.5	3.4	3.7	3.3	3.7	4.1	3.7	3.4	3.3	3.4	3.3	3.5	3.6	3.3	3.4	3.4	3.2	3.3	3.5	3.3	3.5
3.4	3.3	3.4	3.3	3.4	3.2	3.4	3.3	3.3	3.3	3.4	3.6	3.4	3.4	3.4	3.3	3.3	3.5	3.2	3.6	3.8	3.8	3.5	3.3	3.4	3.4	3.3	3.4	3.3	3.3	3.4	3.3	3.3	3.4	3.4	3.3
3.6	3.4	3.4	3.4	3.4	3.3	3.3	3.2	3.3	3.2	3.4	3.5	3.2	3.5	3.3	3.4	3.3	3.5	3.2	3.5	3.4	3.5	3.4	3.4	3.3	3.4	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.3	3.6	3.2
3.7	3.3	3.4	3.4	3.5	3.5	3.5	3.3	3.4	3.0	3.6	4.0	3.4	3.5	3.4	3.4	3.5	3.3	3.1	3.5	3.4	3.4	3.3	3.5	3.2	3.5	3.3	3.1	3.4	3.4	3.5	3.5	3.4	3.4	3.7	3.2
3.7	3.5	3.3	3.5	3.3	3.5	3.4	3.4	3.5	3.0	3.4	4.8	3.9	3.4	3.4	3.4	3.6	3.1	3.4	3.6	4.3	3.7	3.4	3.6	3.2	3.7	3.7	3.2	3.4	4.2	4.3	4.1	3.8	3.5	3.7	3.3
3.7	3.4	3.2	3.2	3.4	3.7	3.3	3.3	3.3	3.3	3.7	4.2	3.8	3.5	3.3	3.5	3.6	3.2	3.8	3.9	3.9	3.8	3.7	3.5	3.2	3.5	3.5	3.3	3.5	4.2	4.1	3.8	3.8	3.7	3.8	3.7
3.3	3.3	3.5	3.2	3.4	3.6	3.5	3.4	3.4	3.6	3.8	3.9	3.7	3.4	3.4	3.7	3.7	3.4	3.6	3.6	3.4	3.6	3.6	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.4	3.3	3.4	3.3	3.4	3.4
3.1	3.1	3.3	3.5	3.1	3.0	2.9	3.0	3.0	2.9	2.9	3.5	3.4	3.0	3.0	3.5	3.6	3.1	3.0	2.8	3.0	2.9	2.9	3.1	3.0	2.8	2.9	2.8	2.6	2.6	2.7	2.9	3.0	2.9	2.9	3.1
2.5	2.3	2.2	2.2	2.1	2.1	2.2	2.3	2.3	2.2	2.2	2.3	2.2	2.3	2.4	2.7	2.8	2.5	2.3	2.1	2.1	2.1	2.4	2.8	2.4	2.0	2.5	2.8	3.0	2.7	2.7	3.1	2.8	2.7	2.7	2.7
1.6	1.7	1.7	1.8	2.1	2.3	2.1	2.0	1.9	1.8	1.7	2.0	2.0	2.1	2.3	2.5	2.7	2.9	3.0	2.8	2.8	2.3	1.8	1.8	2.3	2.3	1.9	2.0	2.1	2.2	2.3	2.1	2.0	2.1	2.3	1.7
2.4	2.3	2.2	2.0	1.8	1.6	1.3	1.0	1.3	1.7	2.1	2.3	2.4	2.5	2.5	2.4	2.3	2.3	2.2	2.1	1.8	1.5	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.9	2.7	2.6

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



9.5	9.5	9.5	9.4	9.2	9.1	9.1	9.2	9.9	11.3	12.9	10.8	11.4	12.1	13.0	10.8	9.4	8.6	7.7	7.4	7.9	8.1	8.1	8.2	9.2	9.6	9.9	10.5	10.7	10.6	10.5	10.4	10.2	10.0	9.8	9.7
9.8	9.3	8.9	8.7	8.7	8.8	9.3	9.5	10.0	11.5	10.5	9.3	11.2	18.0	18.6	10.5	6.1	4.8	4.0	4.7	5.2	5.5	5.8	7.7	9.6	10.7	11.5	12.3	13.0	12.9	12.9	12.1	11.5	11.1	10.5	10.1
7.8	6.7	6.0	6.0	6.0	6.3	7.6	10.1	11.0	11.2	11.3	9.5	5.8	10.6	7.1	4.2	2.9	2.2	3.0	3.6	3.7	4.7	6.3	8.2	9.3	9.7	10.2	12.8	13.7	13.8	13.9	15.2	15.0	11.8	10.8	9.2
3.2	2.9	2.1	1.4	2.3	4.2	4.6	6.5	8.1	9.2	10.1	10.1	5.2	3.4	2.3	1.6	.9	.7	.6	.7	1.1	3.2	4.3	5.6	6.0	6.1	6.2	6.7	7.3	9.4	10.4	10.4	6.2	4.3	3.9	3.4
.9	1.1	.7	.4	.5	1.2	2.8	3.0	2.8	3.2	3.4	3.0	2.1	1.2	1.1	-.3	-.1	.1	-1.4	-.1	.8	1.9	3.1	2.4	2.6	3.3	3.4	4.3	3.6	4.7	5.4	5.0	3.6	2.6	1.7	1.6
-2.4	-3.0	-1.7	-2.6	-2.7	-3.7	-2.2	-1.7	-2.6	-2.4	-3.3	-2.8	-2.0	-1.8	-1.8	-2.4	-2.0	-2.3	-3.6	-4.1	-3.1	-2.9	-1.4	-1.4	-.5	2.9	7.1	6.1	.2	-1.1	-1.3	-1.2	-1.5	-1.3	-2.2	-1.8
-8.2	-6.6	-3.0	-3.7	-5.0	-6.3	-6.0	-6.1	-8.8	-9.0	-8.7	-8.3	-7.9	-8.4	-7.3	-6.0	-6.3	-6.0	-7.5	-7.6	-7.6	-8.6	-8.4	-8.5	-8.9	-10.3	-7.8	-6.5	-5.5	-4.1	-5.4	-7.2	-7.3	-7.6	-7.8	-7.4
-13.0	-11.2	-8.4	-7.4	-6.7	-5.7	-6.6	-8.6	-9.5	-9.7	-10.4	-10.9	-12.5	-12.7	-11.5	-9.4	-5.7	-3.9	-7.2	-10.2	-11.3	-10.0	-10.3	-13.1	-13.6	-13.6	-11.8	-9.6	-8.6	-8.7	-8.6	-10.1	-10.7	-11.7	-13.2	-13.0
-7.2	-7.4	-7.5	-6.9	-7.1	-7.8	-8.2	-8.2	-9.0	-7.4	-7.3	-8.2	-6.7	-6.0	-4.0	-3.0	-3.3	-4.8	-8.4	-9.7	-8.3	-7.5	-9.3	-8.9	-7.9	-7.1	-5.1	-5.8	-5.7	-4.7	-5.1	-6.3	-6.6	-6.4	-7.1	-7.4
-7.2	-7.0	-6.6	-7.1	-8.5	-10.1	-10.7	-10.8	-11.1	-9.1	-3.2	-2.9	-3.4	-3.7	-3.8	-4.9	-6.1	-7.2	-6.5	-4.4	-3.0	-3.8	-4.7	-3.0	-2.2	-2.1	-3.9	-4.9	-5.4	-3.8	-2.6	-2.9	-3.7	-4.8	-3.9	-6.0
-5.5	-4.1	-4.3	-4.3	-5.8	-8.3	-9.8	-11.2	-12.2	-12.7	-7.7	-4.6	-5.1	-5.9	-6.6	-7.6	-8.7	-9.7	-9.1	-6.0	-5.1	-6.2	-6.5	-7.6	-6.4	-6.4	-8.4	-10.5	-11.4	-10.3	-7.7	-7.3	-7.7	-7.0	-5.8	-6.1
-6.8	-5.4	-3.5	-4.4	-3.6	-3.0	-6.6	-9.5	-11.7	-13.7	-15.1	-7.2	-7.0	-5.4	-4.5	-5.2	-6.4	-9.5	-11.3	-11.1	-9.0	-10.4	-11.7	-9.5	-8.3	-7.1	-6.5	-8.0	-10.5	-10.1	-7.5	-7.1	-8.2	-10.5	-8.9	-7.2
-4.9	-3.6	-3.1	-3.6	-3.7	-2.9	-2.7	-5.0	-6.1	-8.4	-9.6	-5.4	-6.5	-6.2	-5.5	-3.5	-3.6	-5.1	-4.8	-6.9	-7.8	-7.4	-7.6	-7.3	-7.2	-6.0	-4.7	-5.2	-5.0	-5.2	-5.0	-5.4	-6.7	-6.0	-5.9	-5.8
-3.2	-2.9	-3.4	-3.9	-3.1	-2.1	-2.2	-2.3	-2.4	-2.3	-2.2	-2.5	-2.7	-2.6	-3.0	-3.4	-3.1	-2.8	-1.0	-1.3	-1.2	-1.9	-2.4	-2.9	-3.0	-2.8	-2.4	-2.1	-1.6	-1.2	-1.3	-1.9	-2.7	-2.8	-2.0	-1.6
-1.3	-1.0	-.3	-.2	.7	1.1	1.0	.8	.6	.8	.8	.9	.6	-.1	.2	.6	.1	.8	1.2	1.3	1.1	.9	1.1	.9	1.1	.9	1.0	1.2	1.1	1.0	1.0	.2	.3	-.9	-1.6	-1.5
1.2	1.5	1.7	2.0	1.9	2.2	2.2	2.2	2.4	2.2	1.9	2.2	1.9	1.4	1.7	2.1	1.8	1.9	1.9	1.9	1.8	2.3	3.4	3.8	2.7	2.1	3.4	4.3	4.3	3.6	3.3	3.2	2.0	1.0	.6	1.0
2.0	2.3	2.6	3.2	4.3	5.1	4.6	4.2	5.0	4.6	3.9	4.0	3.0	3.3	3.3	3.7	4.9	7.7	10.1	11.8	12.1	12.7	13.2	11.7	7.8	8.9	13.0	14.7	13.8	13.2	12.8	11.2	9.1	7.1	3.0	1.9
3.8	3.4	3.4	4.1	5.0	6.0	7.3	9.1	8.9	7.0	5.5	4.8	5.0	5.0	5.9	7.0	7.9	8.9	9.8	10.7	11.7	12.9	13.9	14.0	14.2	14.5	14.2	13.6	12.9	12.0	11.2	10.1	9.0	7.3	4.6	4.0

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

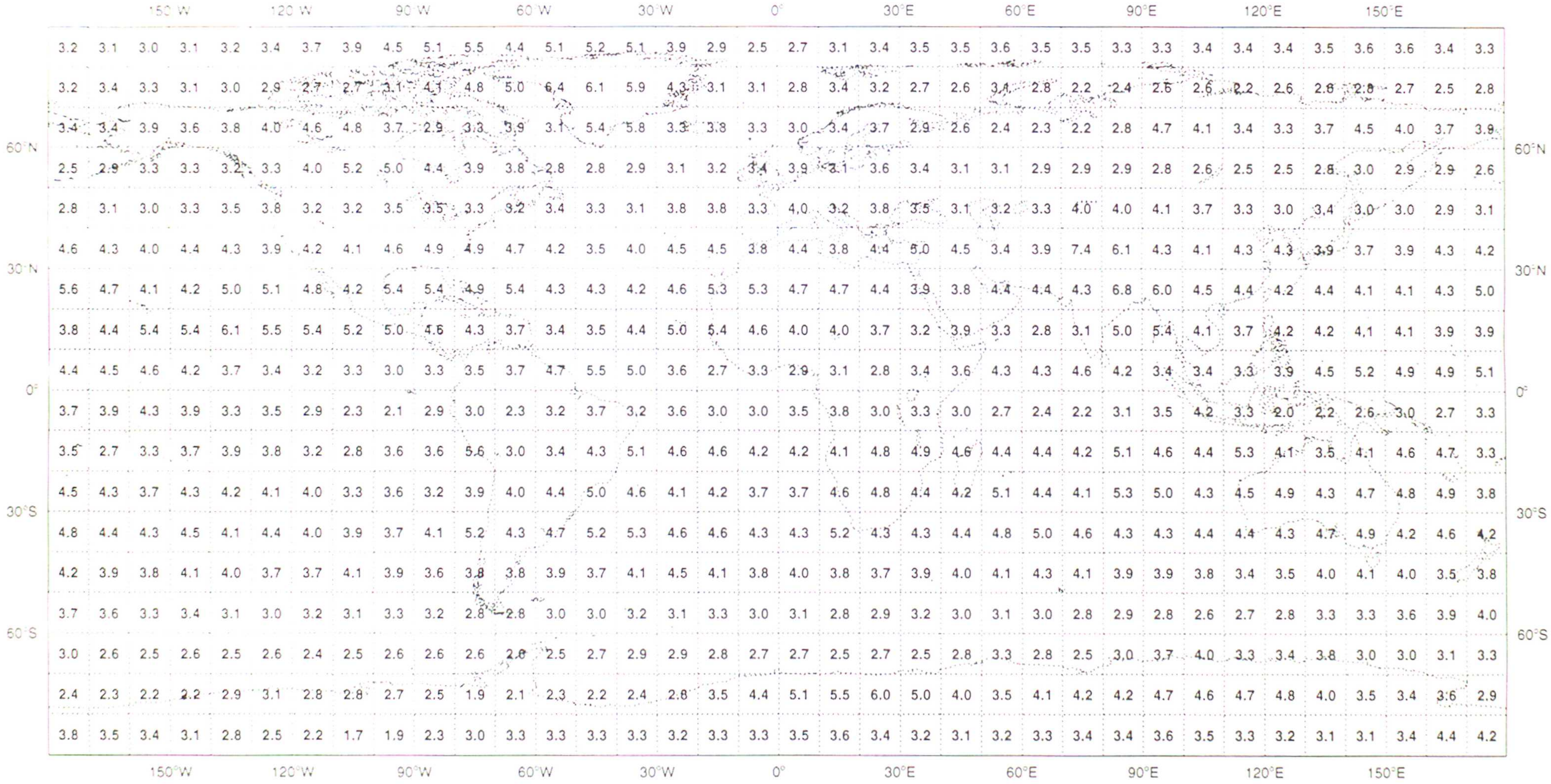
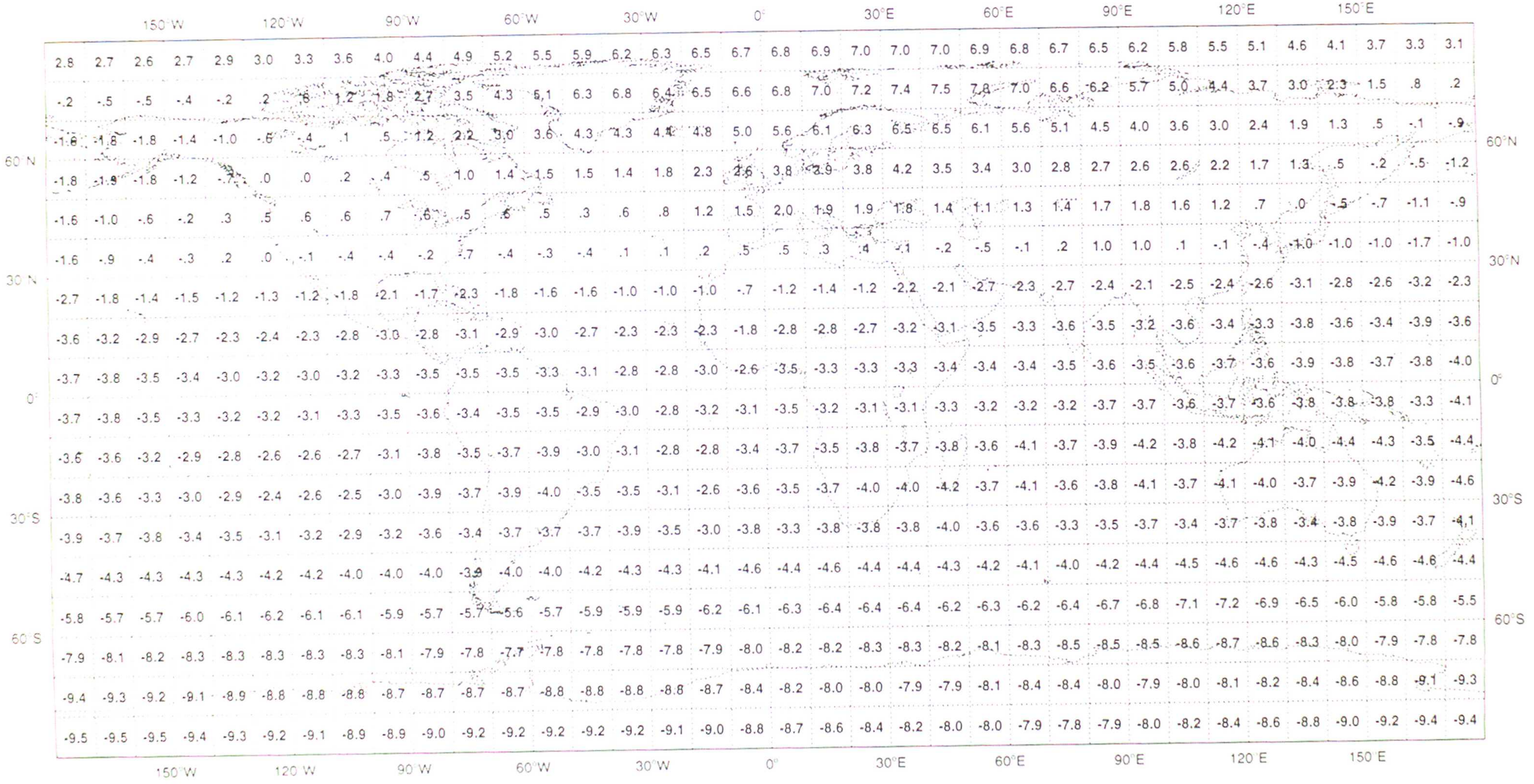

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
3.2 3.1 3.0 3.1 3.2 3.4 3.7 3.9 4.5 5.1 5.5 4.4 5.1 5.2 5.1 3.9 2.9 2.5 2.7 3.1 3.4 3.5 3.5 3.6 3.5 3.5 3.3 3.3 3.4 3.4 3.4 3.5 3.6 3.6 3.4 3.3
3.2 3.4 3.3 3.1 3.0 2.9 2.7 2.7 3.1 4.1 4.8 5.0 6.4 6.1 5.9 4.3 3.1 3.1 2.8 3.4 3.2 2.7 2.6 3.4 2.8 2.2 2.4 2.5 2.6 2.2 2.6 2.8 2.8 2.7 2.5 2.8
3.4 3.4 3.9 3.6 3.8 4.0 4.6 4.8 3.7 2.9 3.3 3.9 3.1 5.4 5.8 3.3 3.8 3.3 3.0 3.4 3.7 2.9 2.6 2.4 2.3 2.2 2.8 4.7 4.1 3.4 3.3 3.7 4.5 4.0 3.7 3.9
2.5 2.9 3.3 3.3 3.2 3.3 4.0 5.2 5.0 4.4 3.9 3.8 2.8 2.8 2.9 3.1 3.2 3.4 3.9 3.1 3.6 3.4 3.1 3.1 2.9 2.9 2.9 2.8 2.6 2.5 2.5 2.8 3.0 2.9 2.9 2.6
2.8 3.1 3.0 3.3 3.5 3.8 3.2 3.2 3.5 3.5 3.3 3.2 3.4 3.3 3.1 3.8 3.8 3.3 4.0 3.2 3.8 3.5 3.1 3.2 3.3 4.0 4.0 4.1 3.7 3.3 3.0 3.4 3.0 3.0 2.9 3.1
4.6 4.3 4.0 4.4 4.3 3.9 4.2 4.1 4.6 4.9 4.9 4.7 4.2 3.5 4.0 4.5 4.5 3.8 4.4 3.8 4.4 5.0 4.5 3.4 3.9 7.4 6.1 4.3 4.1 4.3 4.3 3.9 3.7 3.9 4.3 4.2
5.6 4.7 4.1 4.2 5.0 5.1 4.8 4.2 5.4 5.4 4.9 5.4 4.3 4.3 4.2 4.6 5.3 5.3 4.7 4.7 4.4 3.9 3.8 4.4 4.4 4.3 6.8 6.0 4.5 4.4 4.2 4.4 4.1 4.1 4.3 5.0
3.8 4.4 5.4 5.4 6.1 5.5 5.4 5.2 5.0 4.6 4.3 3.7 3.4 3.5 4.4 5.0 5.4 4.6 4.0 4.0 3.7 3.2 3.9 3.3 2.8 3.1 5.0 5.4 4.1 3.7 4.2 4.2 4.1 4.1 3.9 3.9
4.4 4.5 4.6 4.2 3.7 3.4 3.2 3.3 3.0 3.3 3.5 3.7 4.7 5.5 5.0 3.6 2.7 3.3 2.9 3.1 2.8 3.4 3.6 4.3 4.3 4.6 4.2 3.4 3.4 3.3 3.9 4.5 5.2 4.9 4.9 5.1
3.7 3.9 4.3 3.9 3.3 3.5 2.9 2.3 2.1 2.9 3.0 2.3 3.2 3.7 3.2 3.6 3.0 3.0 3.5 3.8 3.0 3.3 3.0 2.7 2.4 2.2 3.1 3.5 4.2 3.3 2.0 2.2 2.6 3.0 2.7 3.3
3.5 2.7 3.3 3.7 3.9 3.8 3.2 2.8 3.6 3.6 5.6 3.0 3.4 4.3 5.1 4.6 4.6 4.2 4.2 4.1 4.8 4.9 4.6 4.4 4.4 4.2 5.1 4.6 4.4 5.3 4.1 3.5 4.1 4.6 4.7 3.3
4.5 4.3 3.7 4.3 4.2 4.1 4.0 3.3 3.6 3.2 3.9 4.0 4.4 5.0 4.6 4.1 4.2 3.7 3.7 4.6 4.8 4.4 4.2 5.1 4.4 4.1 5.3 5.0 4.3 4.5 4.9 4.3 4.7 4.8 4.9 3.8
4.8 4.4 4.3 4.5 4.1 4.4 4.0 3.9 3.7 4.1 5.2 4.3 4.7 5.2 5.3 4.6 4.6 4.3 4.3 5.2 4.3 4.3 4.4 4.8 5.0 4.6 4.3 4.3 4.4 4.4 4.3 4.7 4.9 4.2 4.6 4.2
4.2 3.9 3.8 4.1 4.0 3.7 3.7 4.1 3.9 3.6 3.8 3.8 3.9 3.7 4.1 4.5 4.1 3.8 4.0 3.8 3.7 3.9 4.0 4.1 4.3 4.1 3.9 3.9 3.8 3.4 3.5 4.0 4.1 4.0 3.5 3.8
3.7 3.6 3.3 3.4 3.1 3.0 3.2 3.1 3.3 3.2 2.8 2.8 3.0 3.0 3.2 3.1 3.3 3.0 3.1 2.8 2.9 3.2 3.0 3.1 3.0 2.8 2.9 2.8 2.6 2.7 2.8 3.3 3.3 3.6 3.9 4.0
3.0 2.6 2.5 2.6 2.5 2.6 2.4 2.5 2.6 2.6 2.6 2.8 2.5 2.7 2.9 2.9 2.8 2.7 2.7 2.5 2.7 2.5 2.8 3.3 2.8 2.5 3.0 3.7 4.0 3.3 3.4 3.8 3.0 3.0 3.1 3.3
2.4 2.3 2.2 2.2 2.9 3.1 2.8 2.8 2.7 2.5 1.9 2.1 2.3 2.2 2.4 2.8 3.5 4.4 5.1 5.5 6.0 5.0 4.0 3.5 4.1 4.2 4.2 4.7 4.6 4.7 4.8 4.0 3.5 3.4 3.6 2.9
3.8 3.5 3.4 3.1 2.8 2.5 2.2 1.7 1.9 2.3 3.0 3.3 3.3 3.3 3.3 3.2 3.3 3.3 3.5 3.6 3.4 3.2 3.1 3.2 3.3 3.4 3.4 3.6 3.5 3.3 3.2 3.1 3.1 3.4 4.4 4.2

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



2.8	2.7	2.6	2.7	2.9	3.0	3.3	3.6	4.0	4.4	4.9	5.2	5.5	5.9	6.2	6.3	6.5	6.7	6.8	6.9	7.0	7.0	7.0	6.9	6.8	6.7	6.5	6.2	5.8	5.5	5.1	4.6	4.1	3.7	3.3	3.1
-.2	-.5	-.5	-.4	-.2	.2	.6	1.2	1.8	2.7	3.5	4.3	5.1	6.3	6.8	6.4	6.5	6.6	6.8	7.0	7.2	7.4	7.5	7.8	7.0	6.6	6.2	5.7	5.0	4.4	3.7	3.0	2.3	1.5	.8	.2
-1.6	-1.8	-1.8	-1.4	-1.0	-.6	-.4	.1	.5	1.2	2.2	3.0	3.6	4.3	4.3	4.4	4.8	5.0	5.6	6.1	6.3	6.5	6.5	6.1	5.6	5.1	4.5	4.0	3.6	3.0	2.4	1.9	1.3	.5	-.1	-.9
-1.8	-1.9	-1.8	-1.2	-.7	.0	.0	.2	.4	.5	1.0	1.4	1.5	1.5	1.4	1.8	2.3	2.6	3.8	3.9	3.8	4.2	3.5	3.4	3.0	2.8	2.7	2.6	2.6	2.2	1.7	1.3	.5	-.2	-.5	-1.2
-1.6	-1.0	-.6	-.2	.3	.5	.6	.6	.7	.6	.5	.6	.5	.3	.6	.8	1.2	1.5	2.0	1.9	1.9	1.8	1.4	1.1	1.3	1.4	1.7	1.8	1.6	1.2	.7	.0	-.5	-.7	-1.1	-.9
-1.6	-.9	-.4	-.3	.2	.0	-.1	-.4	-.4	-.2	-.7	-.4	-.3	-.4	.1	.1	.2	.5	.5	.3	.4	-.1	-.2	-.5	-.1	.2	1.0	1.0	.1	-.1	-.4	-1.0	-1.0	-1.0	-1.7	-1.0
-2.7	-1.8	-1.4	-1.5	-1.2	-1.3	-1.2	-1.8	-2.1	-1.7	-2.3	-1.8	-1.6	-1.6	-1.0	-1.0	-1.0	-.7	-1.2	-1.4	-1.2	-2.2	-2.1	-2.7	-2.3	-2.7	-2.4	-2.1	-2.5	-2.4	-2.6	-3.1	-2.8	-2.6	-3.2	-2.3
-3.6	-3.2	-2.9	-2.7	-2.3	-2.4	-2.3	-2.8	-3.0	-2.8	-3.1	-2.9	-3.0	-2.7	-2.3	-2.3	-2.3	-1.8	-2.8	-2.8	-2.7	-3.2	-3.1	-3.5	-3.3	-3.6	-3.5	-3.2	-3.6	-3.4	-3.3	-3.8	-3.6	-3.4	-3.9	-3.6
-3.7	-3.8	-3.5	-3.4	-3.0	-3.2	-3.0	-3.2	-3.3	-3.5	-3.5	-3.5	-3.3	-3.1	-2.8	-2.8	-3.0	-2.6	-3.5	-3.3	-3.3	-3.3	-3.4	-3.4	-3.4	-3.5	-3.6	-3.5	-3.6	-3.7	-3.6	-3.9	-3.8	-3.7	-3.8	-4.0
-3.7	-3.8	-3.5	-3.3	-3.2	-3.2	-3.1	-3.3	-3.5	-3.6	-3.4	-3.5	-3.5	-2.9	-3.0	-2.8	-3.2	-3.1	-3.5	-3.2	-3.1	-3.1	-3.3	-3.2	-3.2	-3.2	-3.7	-3.7	-3.6	-3.7	-3.6	-3.8	-3.8	-3.8	-3.3	-4.1
-3.6	-3.6	-3.2	-2.9	-2.8	-2.6	-2.6	-2.7	-3.1	-3.8	-3.5	-3.7	-3.9	-3.0	-3.1	-2.8	-2.8	-3.4	-3.7	-3.5	-3.8	-3.7	-3.8	-3.6	-4.1	-3.7	-3.9	-4.2	-3.8	-4.2	-4.1	-4.0	-4.4	-4.3	-3.5	-4.4
-3.8	-3.6	-3.3	-3.0	-2.9	-2.4	-2.6	-2.5	-3.0	-3.9	-3.7	-3.9	-4.0	-3.5	-3.5	-3.1	-2.6	-3.6	-3.5	-3.7	-4.0	-4.0	-4.2	-3.7	-4.1	-3.6	-3.8	-4.1	-3.7	-4.1	-4.0	-3.7	-3.9	-4.2	-3.9	-4.6
-3.9	-3.7	-3.8	-3.4	-3.5	-3.1	-3.2	-2.9	-3.2	-3.6	-3.4	-3.7	-3.7	-3.7	-3.9	-3.5	-3.0	-3.8	-3.3	-3.8	-3.8	-3.8	-4.0	-3.6	-3.6	-3.3	-3.5	-3.7	-3.4	-3.7	-3.8	-3.4	-3.8	-3.9	-3.7	-4.1
-4.7	-4.3	-4.3	-4.3	-4.3	-4.2	-4.2	-4.0	-4.0	-4.0	-3.9	-4.0	-4.0	-4.2	-4.3	-4.3	-4.1	-4.6	-4.4	-4.6	-4.4	-4.4	-4.3	-4.2	-4.1	-4.0	-4.2	-4.4	-4.5	-4.6	-4.6	-4.3	-4.5	-4.6	-4.6	-4.4
-5.8	-5.7	-5.7	-6.0	-6.1	-6.2	-6.1	-6.1	-5.9	-5.7	-5.7	-5.6	-5.7	-5.9	-5.9	-5.9	-6.2	-6.1	-6.3	-6.4	-6.4	-6.4	-6.2	-6.3	-6.2	-6.4	-6.7	-6.8	-7.1	-7.2	-6.9	-6.5	-6.0	-5.8	-5.8	-5.5
-7.9	-8.1	-8.2	-8.3	-8.3	-8.3	-8.3	-8.3	-8.1	-7.9	-7.8	-7.7	-7.8	-7.8	-7.8	-7.8	-7.9	-8.0	-8.2	-8.2	-8.3	-8.3	-8.2	-8.1	-8.3	-8.5	-8.5	-8.5	-8.6	-8.7	-8.6	-8.3	-8.0	-7.9	-7.8	-7.8
-9.4	-9.3	-9.2	-9.1	-8.9	-8.8	-8.8	-8.8	-8.7	-8.7	-8.7	-8.7	-8.8	-8.8	-8.8	-8.8	-8.7	-8.4	-8.2	-8.0	-8.0	-7.9	-7.9	-8.1	-8.4	-8.4	-8.0	-7.9	-8.0	-8.1	-8.2	-8.4	-8.6	-8.8	-9.1	-9.3
-9.5	-9.5	-9.5	-9.4	-9.3	-9.2	-9.1	-8.9	-8.9	-9.0	-9.2	-9.2	-9.2	-9.2	-9.2	-9.1	-9.0	-8.8	-8.7	-8.6	-8.4	-8.2	-8.0	-8.0	-7.9	-7.8	-7.9	-8.0	-8.2	-8.4	-8.6	-8.8	-9.0	-9.2	-9.4	-9.4

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

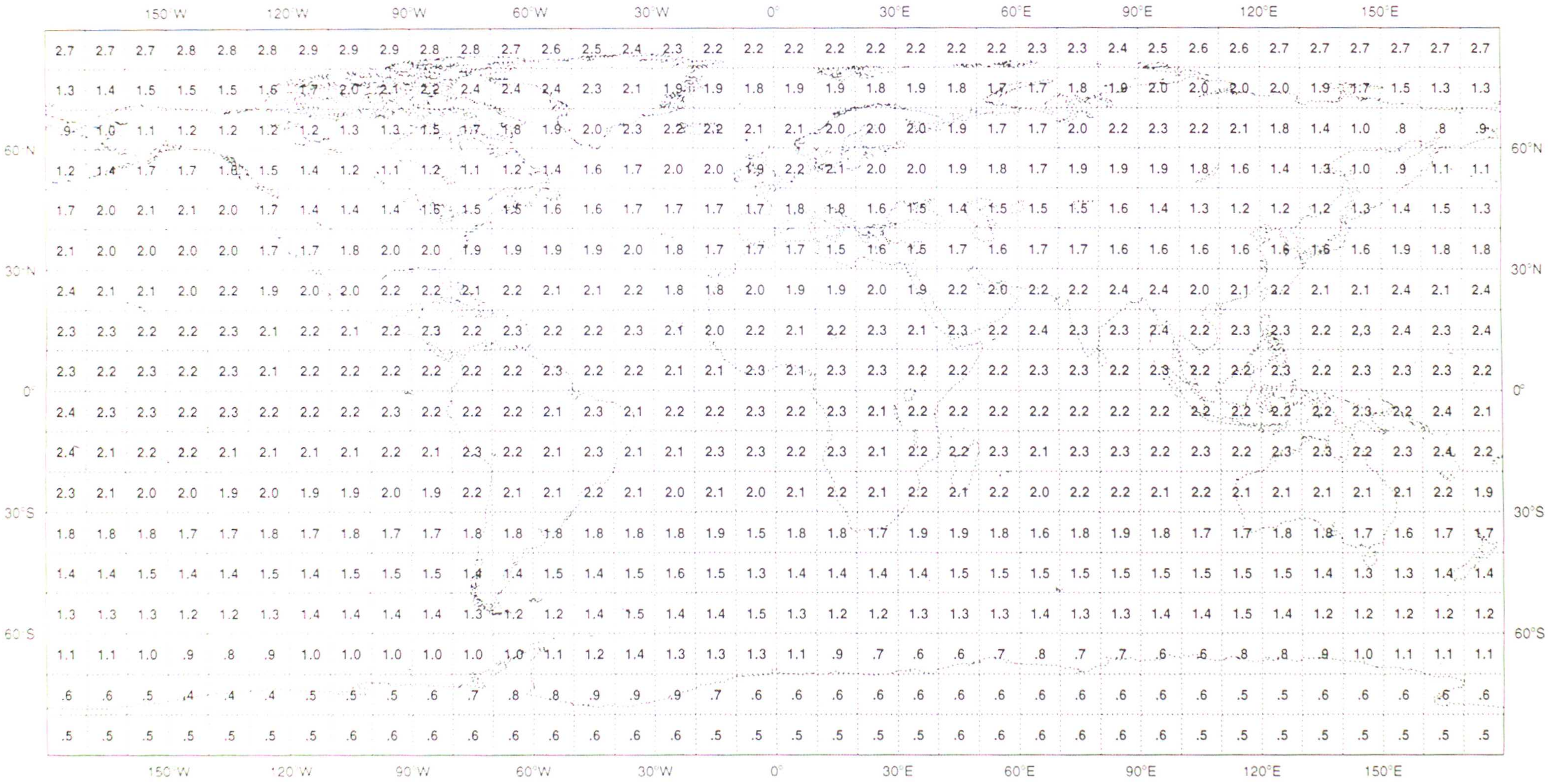

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.7 2.7 2.7 2.8 2.8 2.8 2.9 2.9 2.9 2.8 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.4 2.5 2.6 2.6 2.7 2.7 2.7 2.7 2.7 2.7
1.3 1.4 1.5 1.5 1.5 1.6 1.7 2.0 2.1 2.2 2.4 2.4 2.4 2.3 2.1 1.9 1.9 1.8 1.9 1.9 1.8 1.9 1.8 1.7 1.7 1.8 1.9 2.0 2.0 2.0 2.0 1.9 1.7 1.5 1.3 1.3
.9 1.0 1.1 1.2 1.2 1.2 1.2 1.3 1.3 1.5 1.7 1.8 1.9 2.0 2.3 2.2 2.2 2.1 2.1 2.0 2.0 2.0 1.9 1.7 1.7 2.0 2.2 2.3 2.2 2.1 1.8 1.4 1.0 .8 .8 .9
1.2 1.4 1.7 1.7 1.8 1.5 1.4 1.2 1.1 1.2 1.1 1.2 1.4 1.6 1.7 2.0 2.0 1.9 2.2 2.1 2.0 2.0 1.9 1.8 1.7 1.9 1.9 1.9 1.8 1.6 1.4 1.3 1.0 .9 1.1 1.1
1.7 2.0 2.1 2.1 2.0 1.7 1.4 1.4 1.4 1.6 1.5 1.5 1.6 1.6 1.7 1.7 1.7 1.7 1.8 1.8 1.6 1.5 1.4 1.5 1.5 1.5 1.6 1.4 1.3 1.2 1.2 1.2 1.3 1.4 1.5 1.3
2.1 2.0 2.0 2.0 2.0 1.7 1.7 1.8 2.0 2.0 1.9 1.9 1.9 1.9 2.0 1.8 1.7 1.7 1.7 1.5 1.6 1.5 1.7 1.6 1.7 1.7 1.6 1.6 1.6 1.6 1.6 1.6 1.6 1.9 1.8 1.8
2.4 2.1 2.1 2.0 2.2 1.9 2.0 2.0 2.2 2.2 2.1 2.2 2.1 2.1 2.2 1.8 1.8 2.0 1.9 1.9 2.0 1.9 2.2 2.0 2.2 2.2 2.4 2.4 2.0 2.1 2.2 2.1 2.1 2.4 2.1 2.4
2.3 2.3 2.2 2.2 2.3 2.1 2.2 2.1 2.2 2.3 2.2 2.3 2.2 2.2 2.3 2.1 2.0 2.2 2.1 2.2 2.3 2.1 2.3 2.2 2.4 2.3 2.3 2.4 2.2 2.3 2.3 2.2 2.3 2.4 2.3 2.4
2.3 2.2 2.3 2.2 2.3 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.2 2.2 2.1 2.1 2.3 2.1 2.3 2.3 2.2 2.2 2.2 2.3 2.3 2.2 2.3 2.2 2.2 2.3 2.2 2.3 2.3 2.3 2.2
2.4 2.3 2.3 2.2 2.3 2.2 2.2 2.2 2.3 2.2 2.2 2.2 2.1 2.3 2.1 2.2 2.2 2.3 2.2 2.3 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.2 2.4 2.1
2.4 2.1 2.2 2.2 2.1 2.1 2.1 2.1 2.2 2.1 2.3 2.2 2.1 2.3 2.1 2.1 2.3 2.3 2.2 2.3 2.1 2.2 2.2 2.3 2.1 2.3 2.3 2.2 2.3 2.2 2.3 2.3 2.2 2.3 2.4 2.2
2.3 2.1 2.0 2.0 1.9 2.0 1.9 1.9 2.0 1.9 2.2 2.1 2.1 2.2 2.1 2.0 2.1 2.0 2.1 2.2 2.1 2.2 2.1 2.2 2.0 2.2 2.2 2.1 2.2 2.1 2.1 2.1 2.1 2.1 2.2 1.9
1.8 1.8 1.8 1.7 1.7 1.8 1.7 1.8 1.7 1.7 1.8 1.8 1.8 1.8 1.8 1.8 1.9 1.5 1.8 1.8 1.7 1.9 1.9 1.8 1.6 1.8 1.9 1.8 1.7 1.7 1.8 1.8 1.7 1.6 1.7 1.7
1.4 1.4 1.5 1.4 1.4 1.5 1.4 1.5 1.5 1.5 1.4 1.4 1.5 1.4 1.5 1.6 1.5 1.3 1.4 1.4 1.4 1.4 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.4 1.3 1.3 1.4 1.4
1.3 1.3 1.3 1.2 1.2 1.3 1.4 1.4 1.4 1.4 1.3 1.2 1.2 1.4 1.5 1.4 1.4 1.5 1.3 1.2 1.2 1.3 1.3 1.3 1.4 1.3 1.3 1.4 1.4 1.5 1.4 1.2 1.2 1.2 1.2 1.2
1.1 1.1 1.0 .9 .8 .9 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.2 1.4 1.3 1.3 1.3 1.1 .9 .7 .6 .6 .7 .8 .7 .7 .6 .6 .8 .8 .9 1.0 1.1 1.1 1.1
.6 .6 .5 .4 .4 .4 .5 .5 .5 .6 .7 .8 .8 .9 .9 .9 .7 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6
.5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .6 .6 .5 .5 .5 .5 .5 .5 .5 .5

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

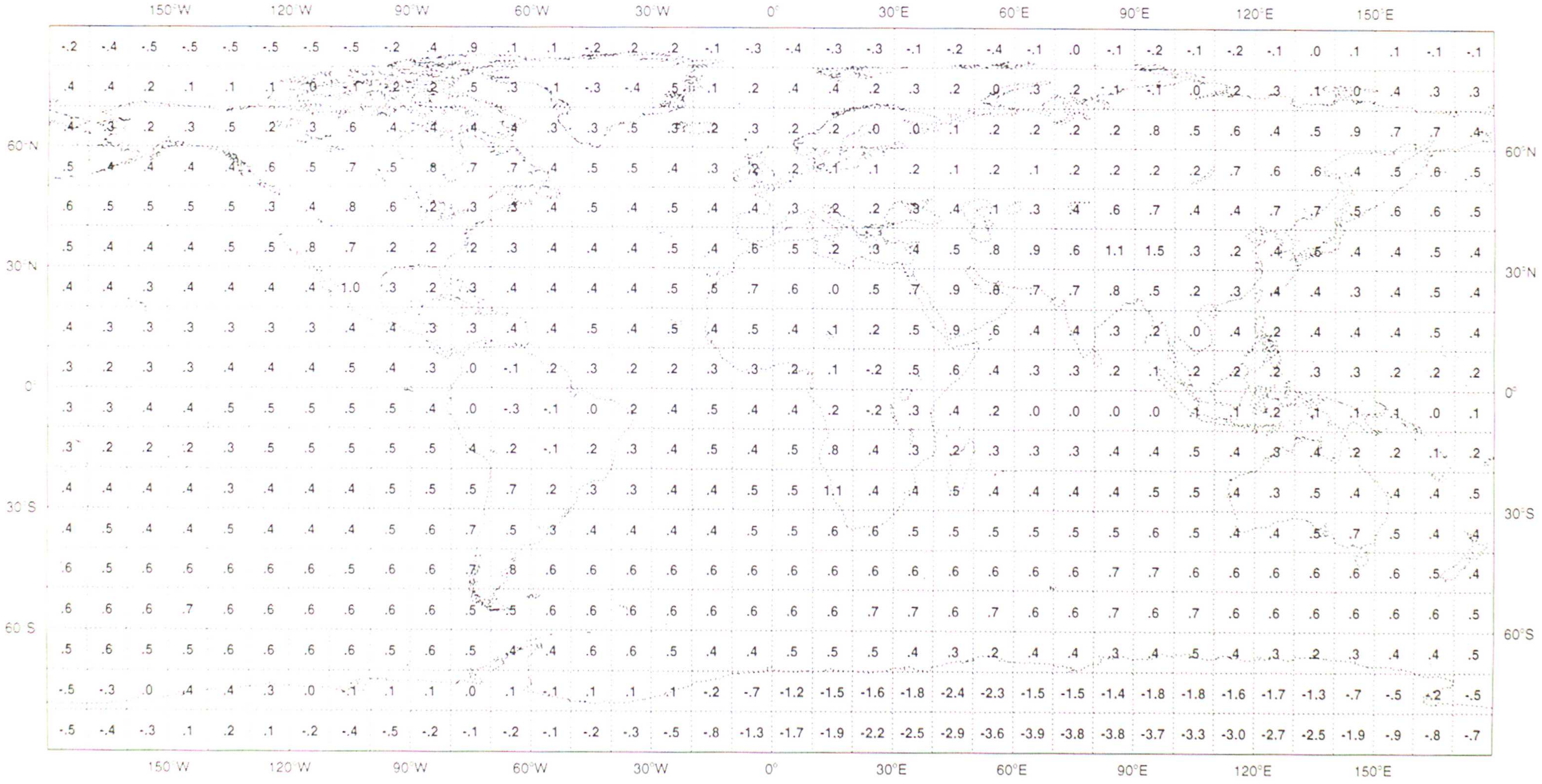
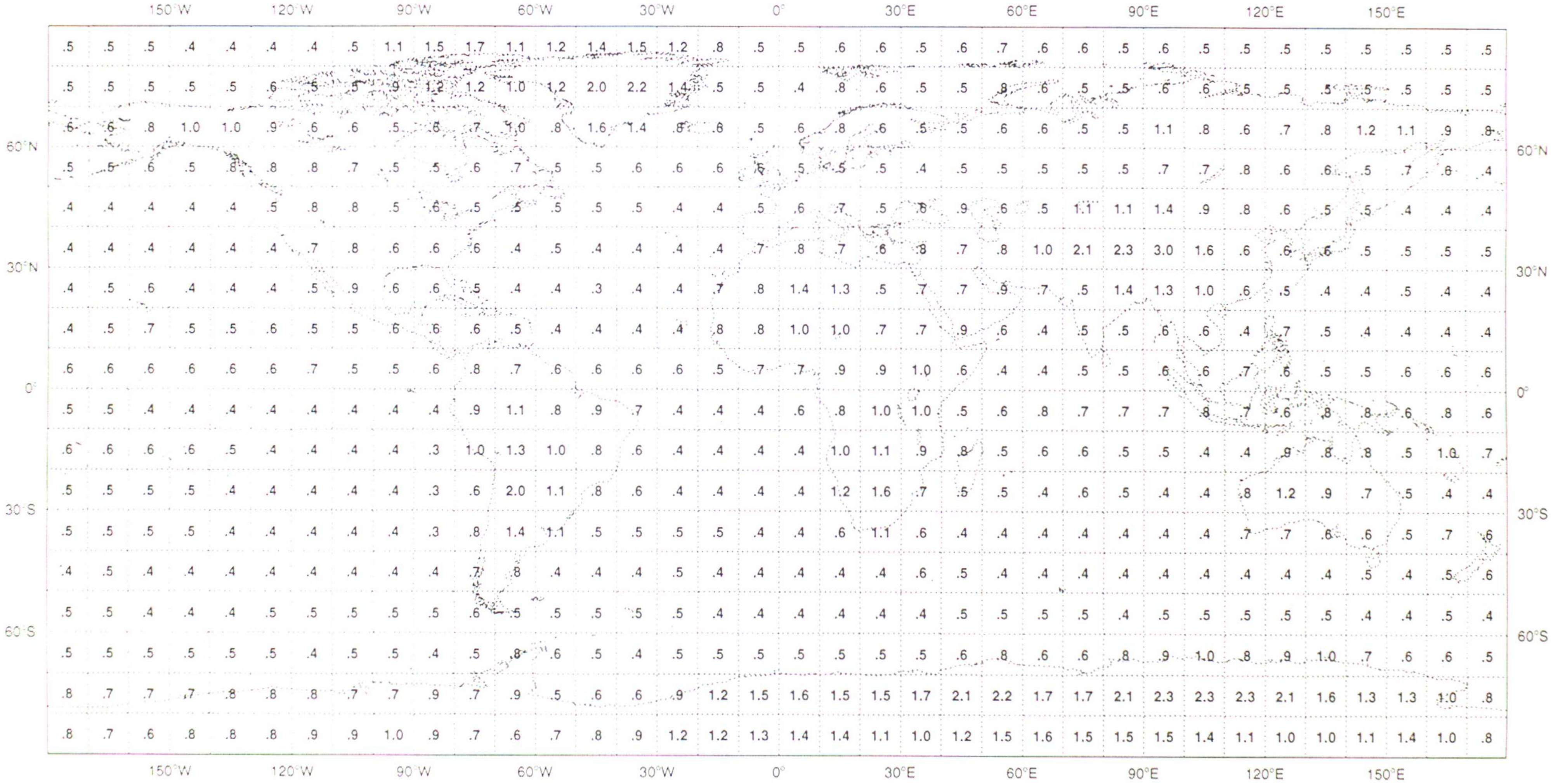

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-.2 -.4 -.5 -.5 -.5 -.5 -.5 -.5 -.2 .4 .9 .1 .1 -.2 .2 .2 -.1 -.3 -.4 -.3 -.3 -.1 -.2 -.4 -.1 .0 -.1 -.2 -.1 -.2 -.1 .0 .1 .1 -.1 -.1
.4 .4 .2 .1 .1 .1 .0 -.1 .2 .2 .5 .3 -.1 -.3 -.4 .5 .1 .2 .4 .4 .2 .3 .2 .0 .3 .2 -.1 -.1 .0 .2 .3 .1 .0 .4 .3 .3
.4 .3 .2 .3 .5 .2 .3 .6 .4 .4 .4 .4 .3 .3 .5 .3 .2 .3 .2 .2 .0 .0 .1 .2 .2 .2 .2 .8 .5 .6 .4 .5 .9 .7 .7 .4
.5 .4 .4 .4 .4 .6 .5 .7 .5 .8 .7 .7 .4 .5 .5 .4 .3 .2 .2 .1 .1 .2 .1 .2 .1 .2 .2 .2 .2 .7 .6 .6 .4 .5 .6 .5
.6 .5 .5 .5 .5 .3 .4 .8 .6 .2 .3 .3 .4 .5 .4 .5 .4 .4 .3 .2 .2 .3 .4 .1 .3 .4 .6 .7 .4 .4 .7 .7 .5 .6 .6 .5
.5 .4 .4 .4 .5 .5 .8 .7 .2 .2 .2 .3 .4 .4 .4 .5 .4 .6 .5 .2 .3 .4 .5 .8 .9 .6 1.1 1.5 .3 .2 .4 .5 .4 .4 .5 .4
.4 .4 .3 .4 .4 .4 .4 1.0 .3 .2 .3 .4 .4 .4 .4 .5 .5 .7 .6 .0 .5 .7 .9 .8 .7 .7 .8 .5 .2 .3 .4 .4 .3 .4 .5 .4
.4 .3 .3 .3 .3 .3 .3 .4 .4 .3 .3 .4 .4 .5 .4 .5 .4 .5 .4 .1 .2 .5 .9 .6 .4 .4 .3 .2 .0 .4 .2 .4 .4 .4 .5 .4
.3 .2 .3 .3 .4 .4 .4 .5 .4 .3 .0 -.1 .2 .3 .2 .2 .3 .3 .2 .1 -.2 .5 .6 .4 .3 .3 .2 .1 .2 .2 .2 .3 .3 .2 .2 .2
.3 .3 .4 .4 .5 .5 .5 .5 .5 .4 .0 -.3 -.1 .0 .2 .4 .5 .4 .4 .2 -.2 .3 .4 .2 .0 .0 .0 .0 .1 .1 .2 .1 .1 .1 .0 .1
.3 .2 .2 .2 .3 .5 .5 .5 .5 .5 .4 .2 -.1 .2 .3 .4 .5 .4 .5 .8 .4 .3 .2 .3 .3 .3 .4 .4 .5 .4 .3 .4 .2 .2 .1 .2
.4 .4 .4 .4 .3 .4 .4 .4 .5 .5 .5 .7 .2 .3 .3 .4 .4 .5 .5 1.1 .4 .4 .5 .4 .4 .4 .4 .5 .5 .4 .3 .5 .4 .4 .4 .5
.4 .5 .4 .4 .5 .4 .4 .4 .5 .6 .7 .5 .3 .4 .4 .4 .4 .5 .5 .6 .6 .5 .5 .5 .5 .5 .5 .6 .5 .4 .4 .5 .7 .5 .4 .4
.6 .5 .6 .6 .6 .6 .6 .5 .6 .6 .7 .8 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .6 .5 .4
.6 .6 .6 .7 .6 .6 .6 .6 .6 .6 .5 .5 .6 .6 .6 .6 .6 .6 .6 .6 .7 .7 .6 .7 .6 .6 .7 .6 .7 .6 .6 .6 .6 .6 .6 .5
.5 .6 .5 .5 .6 .6 .6 .6 .5 .6 .5 .4 .4 .6 .6 .5 .4 .4 .5 .5 .5 .4 .3 .2 .4 .4 .3 .4 .5 .4 .3 .2 .3 .4 .4 .5
-.5 -.3 .0 .4 .4 .3 .0 -.1 .1 .1 .0 .1 -.1 .1 .1 .1 -.2 -.7 -1.2 -1.5 -1.6 -1.8 -2.4 -2.3 -1.5 -1.5 -1.4 -1.8 -1.8 -1.6 -1.7 -1.3 -.7 -.5 -.2 -.5
-.5 -.4 -.3 .1 .2 .1 -.2 -.4 -.5 -.2 -.1 -.2 -.1 -.2 -.3 -.5 -.8 -1.3 -1.7 -1.9 -2.2 -2.5 -2.9 -3.6 -3.9 -3.8 -3.8 -3.7 -3.3 -3.0 -2.7 -2.5 -1.9 -.9 -.8 -.7

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



.5	.5	.5	.4	.4	.4	.4	.5	1.1	1.5	1.7	1.1	1.2	1.4	1.5	1.2	.8	.5	.5	.6	.6	.5	.6	.7	.6	.6	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5
.5	.5	.5	.5	.5	.6	.5	.5	.9	1.2	1.2	1.0	1.2	2.0	2.2	1.4	.5	.5	.4	.8	.6	.5	.5	.8	.6	.5	.5	.6	.6	.5	.5	.5	.5	.5	.5	.5
.6	.6	.8	1.0	1.0	.9	.6	.6	.5	.6	.7	1.0	.8	1.6	1.4	.8	.6	.5	.6	.8	.6	.5	.5	.6	.6	.5	.5	1.1	.8	.6	.7	.8	1.2	1.1	.9	.8
.5	.5	.6	.5	.8	.8	.8	.7	.5	.5	.6	.7	.5	.5	.6	.6	.6	.6	.5	.5	.5	.4	.5	.5	.5	.5	.5	.7	.7	.8	.6	.6	.5	.7	.6	.4
.4	.4	.4	.4	.4	.5	.8	.8	.5	.6	.5	.5	.5	.5	.5	.4	.4	.5	.6	.7	.5	.8	.9	.6	.5	1.1	1.1	1.4	.9	.8	.6	.5	.5	.4	.4	.4
.4	.4	.4	.4	.4	.4	.7	.8	.6	.6	.6	.4	.5	.4	.4	.4	.4	.7	.8	.7	.6	.8	.7	.8	1.0	2.1	2.3	3.0	1.6	.6	.6	.6	.5	.5	.5	.5
.4	.5	.6	.4	.4	.4	.5	.9	.6	.6	.5	.4	.4	.3	.4	.4	.7	.8	1.4	1.3	.5	.7	.7	.9	.7	.5	1.4	1.3	1.0	.6	.5	.4	.4	.5	.4	.4
.4	.5	.7	.5	.5	.6	.5	.5	.6	.6	.6	.5	.4	.4	.4	.4	.8	.8	1.0	1.0	.7	.7	.9	.6	.4	.5	.5	.6	.6	.4	.7	.5	.4	.4	.4	.4
.6	.6	.6	.6	.6	.6	.7	.5	.5	.6	.8	.7	.6	.6	.6	.6	.5	.7	.7	.9	.9	1.0	.6	.4	.4	.5	.5	.6	.6	.7	.6	.5	.5	.6	.6	.6
.5	.5	.4	.4	.4	.4	.4	.4	.4	.4	.9	1.1	.8	.9	.7	.4	.4	.4	.6	.8	1.0	1.0	.5	.6	.8	.7	.7	.7	.8	.7	.6	.8	.8	.6	.8	.6
.6	.6	.6	.6	.5	.4	.4	.4	.4	.3	1.0	1.3	1.0	.8	.6	.4	.4	.4	.4	1.0	1.1	.9	.8	.5	.6	.6	.5	.5	.4	.4	.9	.8	.8	.5	1.0	.7
.5	.5	.5	.5	.4	.4	.4	.4	.4	.3	.6	2.0	1.1	.8	.6	.4	.4	.4	.4	1.2	1.6	.7	.5	.5	.4	.6	.5	.4	.4	.8	1.2	.9	.7	.5	.4	.4
.5	.5	.5	.5	.4	.4	.4	.4	.4	.3	.8	1.4	1.1	.5	.5	.5	.5	.4	.4	.6	1.1	.6	.4	.4	.4	.4	.4	.4	.4	.7	.7	.6	.6	.5	.7	.6
.4	.5	.4	.4	.4	.4	.4	.4	.4	.4	.7	.8	.4	.4	.4	.5	.4	.4	.4	.4	.4	.6	.5	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.5	.6
.5	.5	.4	.4	.4	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.4	.4	.4	.4	.4	.4	.5	.5	.5	.5	.4	.5	.5	.5	.5	.5	.4	.4	.5	.4
.5	.5	.5	.5	.5	.5	.4	.5	.5	.4	.5	.8	.6	.5	.4	.5	.5	.5	.5	.5	.5	.5	.6	.8	.6	.6	.8	.9	1.0	.8	.9	1.0	.7	.6	.6	.5
.8	.7	.7	.7	.8	.8	.8	.7	.7	.9	.7	.9	.5	.6	.6	.9	1.2	1.5	1.6	1.5	1.5	1.7	2.1	2.2	1.7	1.7	2.1	2.3	2.3	2.3	2.1	1.6	1.3	1.3	1.0	.8
.8	.7	.6	.8	.8	.8	.9	.9	1.0	.9	.7	.6	.7	.8	.9	1.2	1.2	1.3	1.4	1.4	1.1	1.0	1.2	1.5	1.6	1.5	1.5	1.5	1.4	1.1	1.0	1.0	1.1	1.4	1.0	.8

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

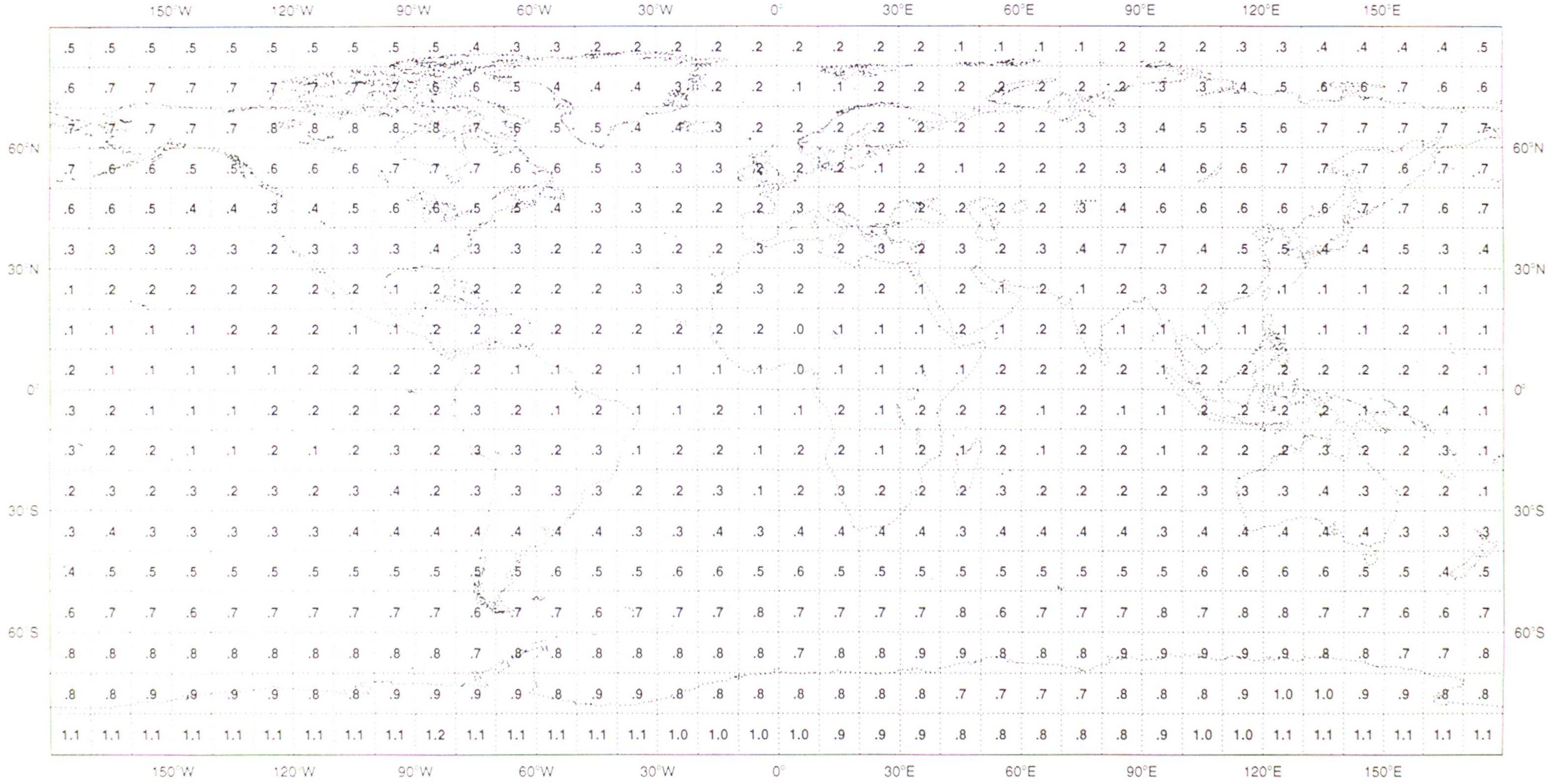

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .3 .3 .2 .2 .2 .2 .2 .2 .2 .2 .2 .1 .1 .1 .1 .2 .2 .2 .3 .3 .4 .4 .4 .4 .5
.6 .7 .7 .7 .7 .7 .7 .7 .7 .6 .6 .5 .4 .4 .4 .3 .2 .2 .1 .1 .2 .2 .2 .2 .2 .2 .2 .3 .3 .4 .5 .6 .6 .7 .6 .6
.7 .7 .7 .7 .7 .8 .8 .8 .8 .8 .7 .6 .5 .5 .4 .4 .3 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .4 .5 .5 .6 .7 .7 .7 .7 .7
.7 .6 .6 .5 .5 .6 .6 .6 .7 .7 .7 .6 .6 .5 .3 .3 .3 .2 .2 .2 .1 .2 .1 .2 .2 .2 .3 .4 .6 .6 .7 .7 .7 .6 .7 .7
.6 .6 .5 .4 .4 .3 .4 .5 .6 .6 .5 .5 .4 .3 .3 .2 .2 .2 .3 .2 .2 .2 .2 .2 .2 .3 .4 .6 .6 .6 .6 .6 .7 .7 .6 .7
.3 .3 .3 .3 .3 .2 .3 .3 .3 .4 .3 .3 .2 .2 .3 .2 .2 .3 .3 .2 .3 .2 .3 .2 .3 .4 .7 .7 .4 .5 .5 .4 .4 .5 .3 .4
.1 .2 .2 .2 .2 .2 .2 .2 .1 .2 .2 .2 .2 .2 .3 .3 .2 .3 .2 .2 .2 .1 .2 .1 .2 .1 .2 .3 .2 .2 .1 .1 .1 .2 .1 .1
.1 .1 .1 .1 .2 .2 .2 .1 .1 .2 .2 .2 .2 .2 .2 .2 .2 .2 .0 .1 .1 .1 .2 .1 .2 .2 .1 .1 .1 .1 .1 .1 .1 .2 .1 .1
.2 .1 .1 .1 .1 .1 .2 .2 .2 .2 .2 .1 .1 .2 .1 .1 .1 .1 .0 .1 .1 .1 .1 .2 .2 .2 .2 .1 .2 .2 .2 .2 .2 .2 .2 .1
.3 .2 .1 .1 .1 .2 .2 .2 .2 .2 .3 .2 .1 .2 .1 .1 .2 .1 .1 .2 .1 .2 .2 .2 .1 .2 .1 .1 .2 .2 .2 .2 .1 .2 .4 .1
.3 .2 .2 .1 .1 .2 .1 .2 .3 .2 .3 .3 .2 .3 .1 .2 .2 .1 .2 .2 .1 .2 .1 .2 .1 .2 .2 .1 .2 .2 .2 .3 .2 .2 .3 .1
.2 .3 .2 .3 .2 .3 .2 .3 .4 .2 .3 .3 .3 .3 .2 .2 .3 .1 .2 .3 .2 .2 .2 .3 .2 .2 .2 .2 .3 .3 .3 .4 .3 .2 .2 .1
.3 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .3 .3 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .3 .3
.4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .5 .6 .6 .5 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .6 .5 .5 .4 .5
.6 .7 .7 .6 .7 .7 .7 .7 .7 .7 .6 .7 .7 .6 .7 .7 .7 .8 .7 .7 .7 .7 .8 .6 .7 .7 .7 .8 .7 .8 .8 .7 .7 .6 .6 .7
.8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .7 .8 .8 .8 .8 .8 .8 .8 .7 .8 .8 .9 .9 .8 .8 .8 .9 .9 .9 .9 .9 .8 .8 .7 .7 .8
.8 .8 .9 .9 .9 .9 .8 .8 .9 .9 .9 .9 .8 .9 .9 .8 .8 .8 .8 .8 .8 .8 .7 .7 .7 .7 .8 .8 .8 .9 1.0 1.0 .9 .9 .8 .8
1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.1 1.0 1.0 1.0 1.0 .9 .9 .9 .8 .8 .8 .8 .8 .9 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.1

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

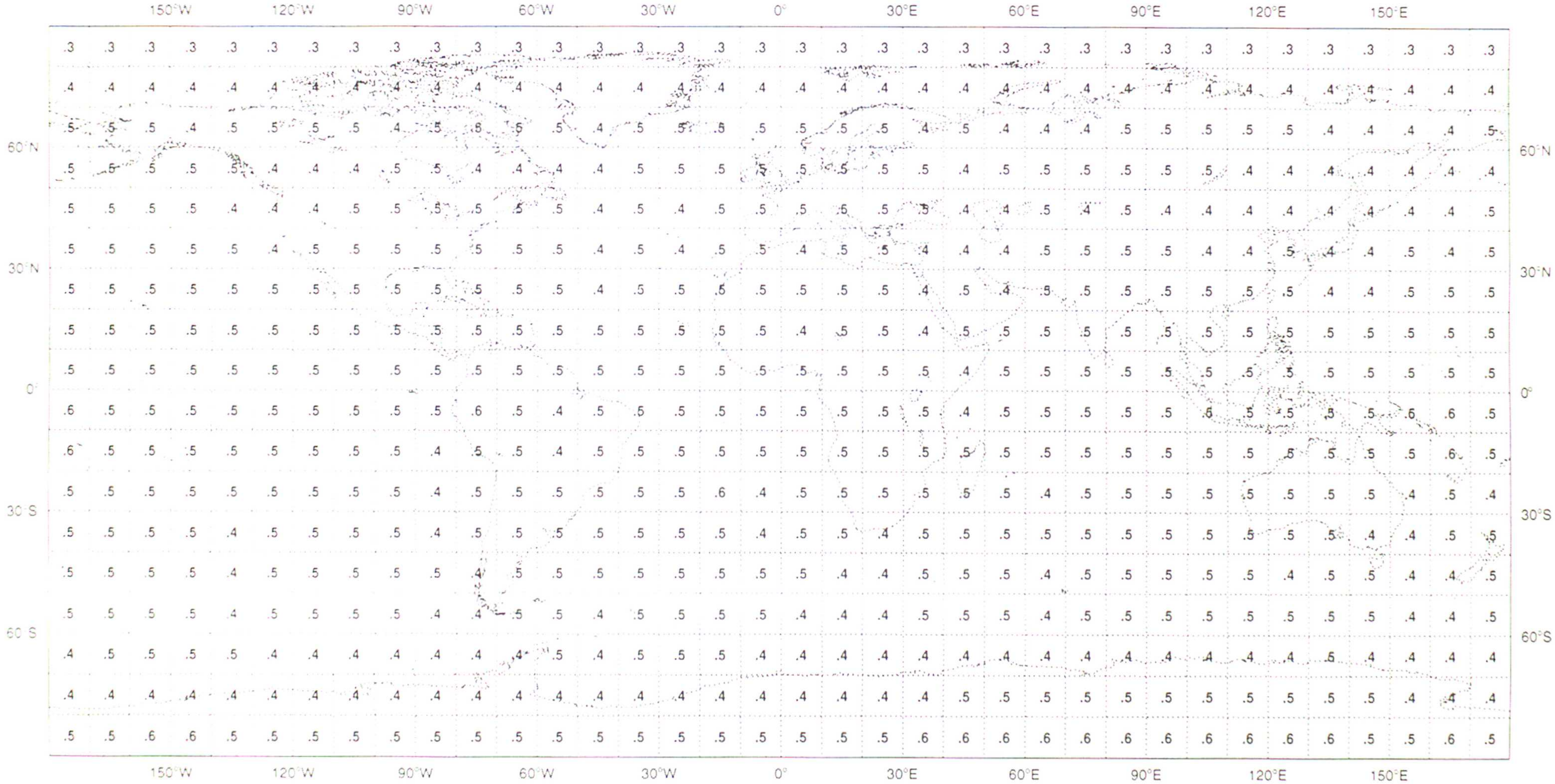

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

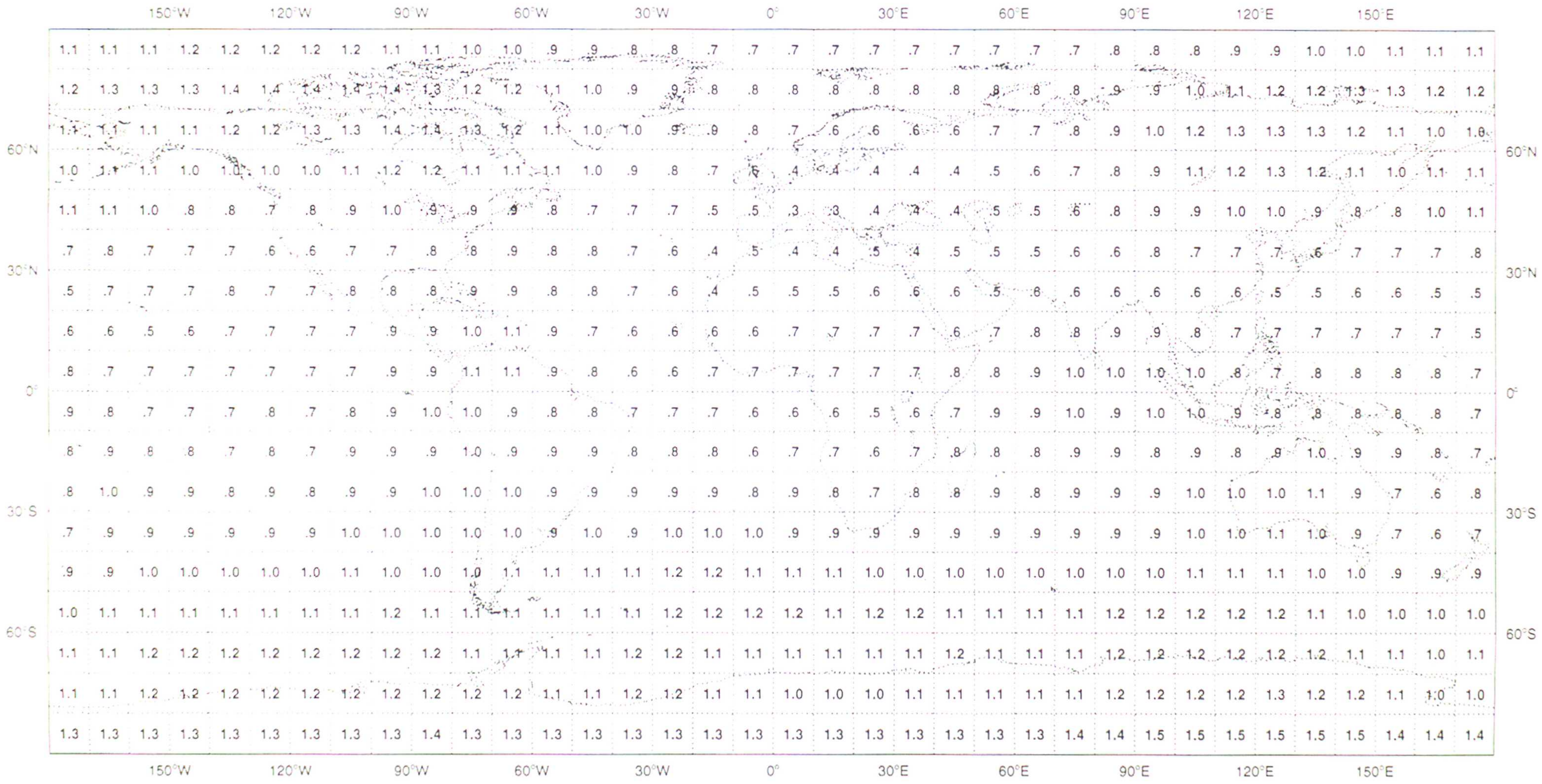

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.0 1.0 .9 .9 .8 .8 .7 .7 .7 .7 .7 .7 .7 .7 .7 .7 .8 .8 .8 .9 .9 1.0 1.0 1.1 1.1 1.1
1.2 1.3 1.3 1.3 1.4 1.4 1.4 1.4 1.4 1.3 1.2 1.2 1.1 1.0 .9 .9 .8 .8 .8 .8 .8 .8 .8 .8 .8 .8 .9 .9 1.0 1.1 1.2 1.2 1.3 1.3 1.2 1.2
1.1 1.1 1.1 1.1 1.2 1.2 1.3 1.3 1.4 1.4 1.3 1.2 1.1 1.0 1.0 .9 .9 .8 .7 .6 .6 .6 .6 .7 .7 .8 .9 1.0 1.2 1.3 1.3 1.3 1.2 1.1 1.0 1.0
1.0 1.1 1.1 1.0 1.0 1.0 1.0 1.1 1.2 1.2 1.1 1.1 1.1 1.0 .9 .8 .7 .6 .4 .4 .4 .4 .4 .5 .6 .7 .8 .9 1.1 1.2 1.3 1.2 1.1 1.0 1.1 1.1
1.1 1.1 1.0 .8 .8 .7 .8 .9 1.0 .9 .9 .9 .8 .7 .7 .7 .5 .5 .3 .3 .4 .4 .4 .5 .5 .6 .8 .9 .9 1.0 1.0 .9 .8 .8 1.0 1.1
.7 .8 .7 .7 .7 .6 .6 .7 .7 .8 .8 .9 .8 .8 .7 .6 .4 .5 .4 .4 .5 .4 .5 .5 .5 .6 .6 .8 .7 .7 .7 .6 .7 .7 .7 .8
.5 .7 .7 .7 .8 .7 .7 .8 .8 .8 .9 .9 .8 .8 .7 .6 .4 .5 .5 .5 .6 .6 .6 .5 .6 .6 .6 .6 .6 .6 .5 .5 .6 .6 .5 .5
.6 .6 .5 .6 .7 .7 .7 .7 .9 .9 1.0 1.1 .9 .7 .6 .6 .6 .6 .7 .7 .7 .7 .6 .7 .8 .8 .9 .9 .8 .7 .7 .7 .7 .7 .7 .5
.8 .7 .7 .7 .7 .7 .7 .7 .9 .9 1.1 1.1 .9 .8 .6 .6 .7 .7 .7 .7 .7 .7 .8 .8 .9 1.0 1.0 1.0 1.0 .8 .7 .8 .8 .8 .8 .7
.9 .8 .7 .7 .7 .8 .7 .8 .9 1.0 1.0 .9 .8 .8 .7 .7 .7 .6 .6 .6 .5 .6 .7 .9 .9 1.0 .9 1.0 1.0 .9 .8 .8 .8 .8 .8 .7
.8 .9 .8 .8 .7 .8 .7 .9 .9 .9 1.0 .9 .9 .9 .8 .8 .8 .6 .7 .7 .6 .7 .8 .8 .8 .9 .9 .8 .9 .8 .9 1.0 .9 .9 .8 .7
.8 1.0 .9 .9 .8 .9 .8 .9 .9 1.0 1.0 1.0 .9 .9 .9 .9 .9 .8 .9 .8 .7 .8 .8 .9 .8 .9 .9 .9 1.0 1.0 1.0 1.1 .9 .7 .6 .8
.7 .9 .9 .9 .9 .9 .9 1.0 1.0 1.0 1.0 1.0 .9 1.0 .9 1.0 1.0 1.0 .9 .9 .9 .9 .9 .9 .9 .9 1.0 1.0 1.1 1.0 .9 .7 .6 .7
.9 .9 1.0 1.0 1.0 1.0 1.0 1.1 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.2 1.2 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.1 1.1 1.0 1.0 .9 .9 .9
1.0 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.1 1.2 1.2 1.1 1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.1 1.0 1.0 1.0 1.0
1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.1 1.1 1.2 1.2 1.1 1.1 1.1 1.1 1.1 1.1 1.2 1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.0 1.1
1.1 1.1 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.1 1.1 1.2 1.2 1.1 1.1 1.0 1.0 1.0 1.1 1.1 1.1 1.1 1.1 1.2 1.2 1.2 1.2 1.3 1.2 1.2 1.1 1.0 1.0
1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.4 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.4 1.4 1.5 1.5 1.5 1.5 1.5 1.5 1.4 1.4 1.4

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

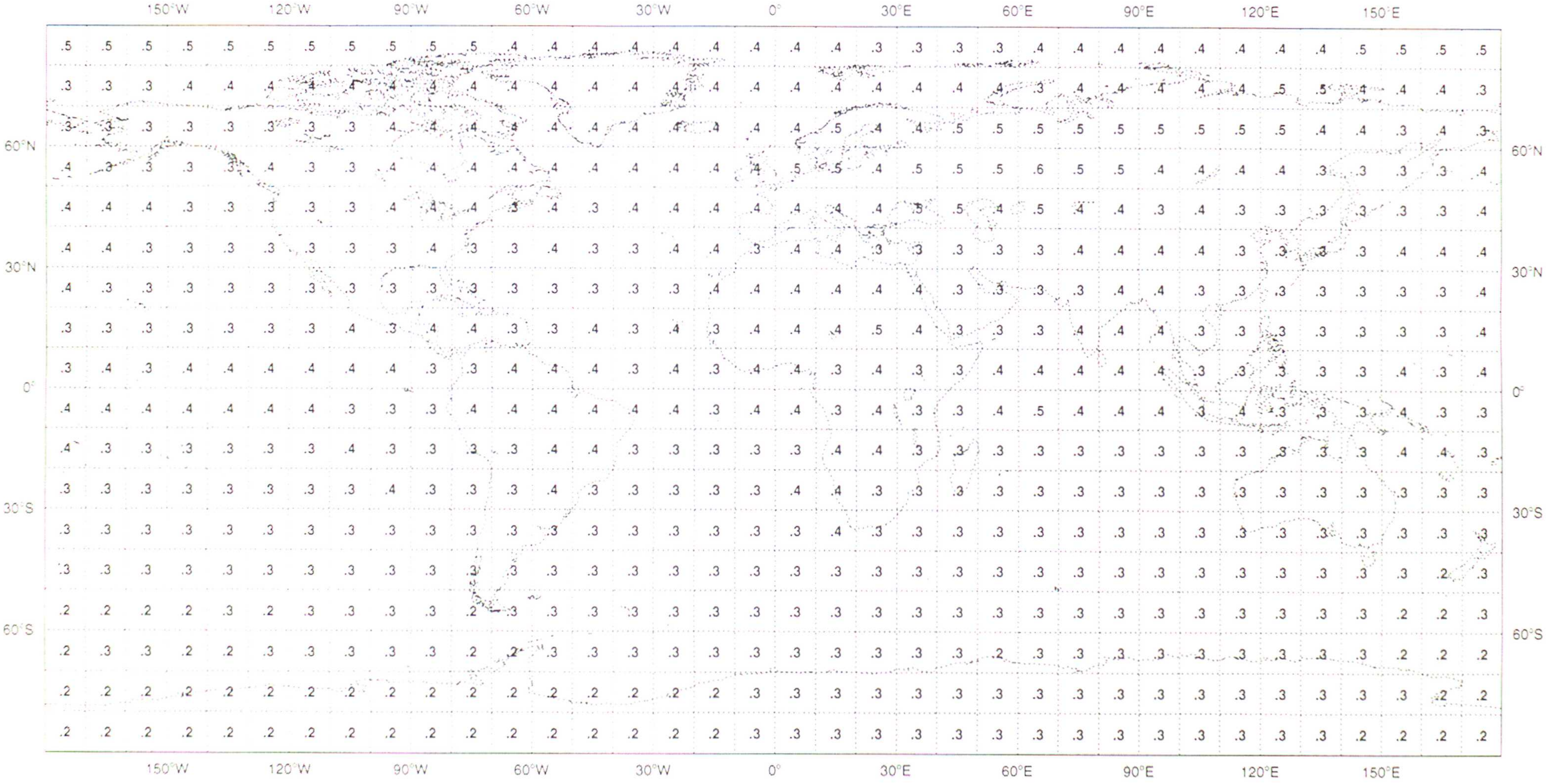
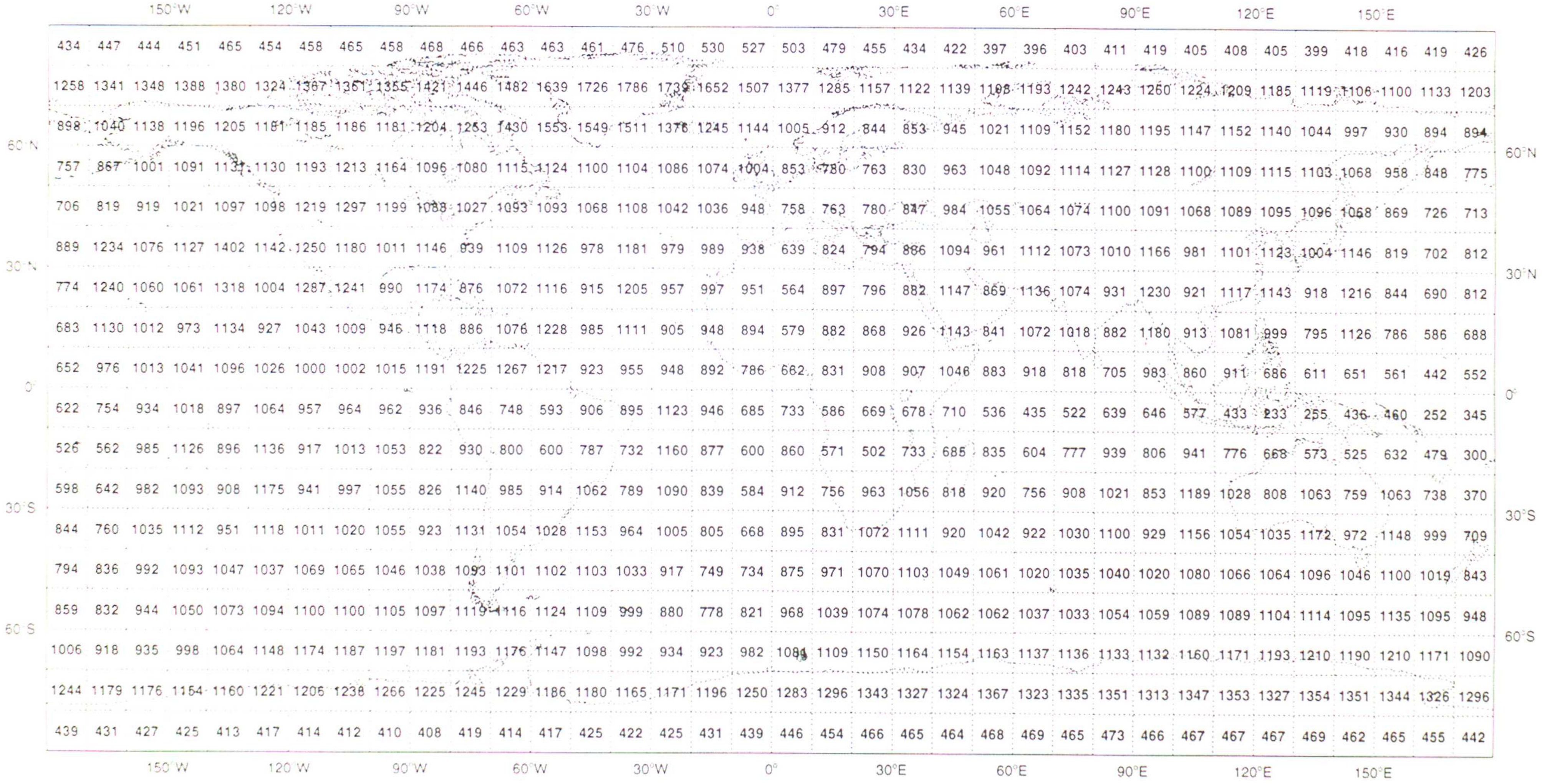
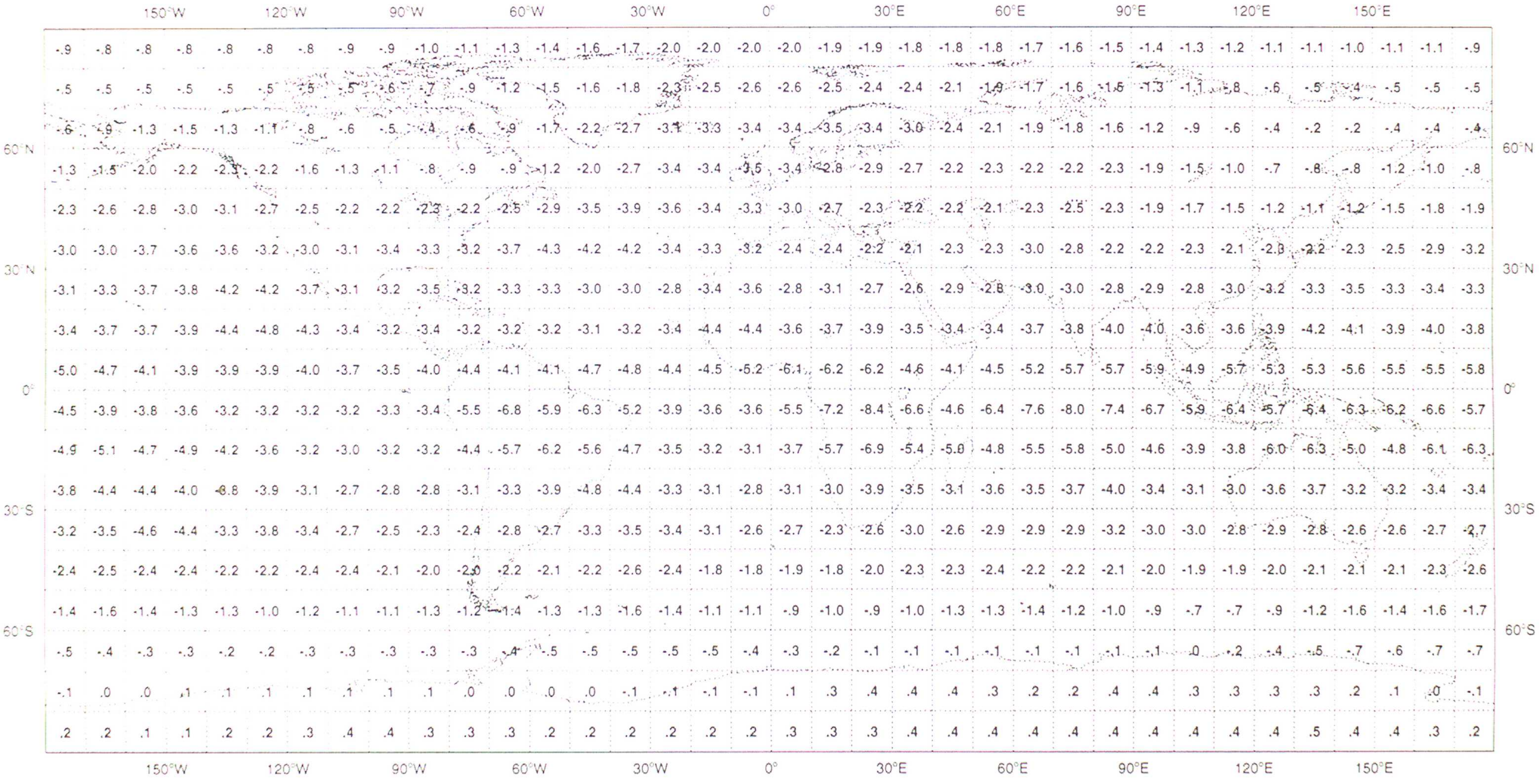

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5
.3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .5 .5 .4 .4 .4 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .3 .4 .3
.4 .3 .3 .3 .3 .4 .3 .3 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .5 .5 .5 .6 .5 .5 .4 .4 .4 .4 .3 .3 .3 .3 .4
.4 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .3 .4 .3 .4 .4 .4 .4 .4 .4 .4 .5 .5 .4 .5 .4 .4 .3 .4 .3 .3 .3 .3 .3 .3 .4
.4 .4 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .4 .3 .3 .4 .4 .3 .4 .4 .3 .3 .3 .3 .3 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .4
.4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4
.3 .3 .3 .3 .3 .3 .3 .4 .3 .4 .4 .3 .3 .4 .3 .4 .3 .4 .4 .4 .5 .4 .3 .3 .3 .4 .4 .4 .3 .3 .3 .3 .3 .3 .3 .4
.3 .4 .3 .4 .4 .4 .4 .4 .4 .3 .3 .4 .4 .4 .3 .4 .3 .4 .4 .3 .4 .3 .3 .4 .4 .4 .4 .4 .3 .3 .3 .3 .3 .4 .3 .4
.4 .4 .4 .4 .4 .4 .4 .3 .3 .3 .4 .4 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .3 .4 .5 .4 .4 .4 .3 .4 .3 .3 .3 .4 .3 .3
.4 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .4 .3
.3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .4 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3
.2 .2 .2 .2 .3 .2 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .3
.2 .3 .3 .2 .2 .3 .3 .3 .3 .3 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2
.2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .2 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .2 .2 .2 .2

Figure 40. ATOVS mean daily count. JANUARY 2002
NOAA16, using all observations
Global average number of observations in 24 hours = 614368



434	447	444	451	465	454	458	465	458	468	466	463	463	461	476	510	530	527	503	479	455	434	422	397	396	403	411	419	405	408	405	399	418	416	419	426
1258	1341	1348	1388	1380	1324	1367	1361	1355	1421	1446	1482	1639	1726	1786	1739	1652	1507	1377	1285	1157	1122	1139	1198	1193	1242	1243	1260	1224	1209	1185	1119	1106	1100	1133	1203
898	1040	1138	1196	1205	1181	1185	1186	1181	1204	1253	1430	1553	1549	1511	1376	1245	1144	1005	912	844	853	945	1021	1109	1152	1180	1195	1147	1152	1140	1044	997	930	894	894
757	867	1001	1091	1131	1130	1193	1213	1164	1096	1080	1115	1124	1100	1104	1086	1074	1004	853	780	763	830	963	1048	1092	1114	1127	1128	1100	1109	1115	1103	1068	958	848	775
706	819	919	1021	1097	1098	1219	1297	1199	1088	1027	1093	1093	1068	1108	1042	1036	948	758	763	780	847	984	1055	1064	1074	1100	1091	1068	1089	1095	1096	1068	869	726	713
889	1234	1076	1127	1402	1142	1250	1180	1011	1146	939	1109	1126	978	1181	979	989	938	639	824	794	886	1094	961	1112	1073	1010	1166	981	1101	1123	1004	1146	819	702	812
774	1240	1060	1061	1318	1004	1287	1241	890	1174	876	1072	1116	915	1205	957	997	951	564	897	796	882	1147	869	1136	1074	931	1230	921	1117	1143	918	1216	844	690	812
683	1130	1012	973	1134	927	1043	1009	946	1118	886	1076	1228	985	1111	905	948	894	579	882	868	926	1143	841	1072	1018	882	1180	913	1081	999	795	1126	786	586	688
652	976	1013	1041	1096	1026	1000	1002	1015	1191	1225	1267	1217	923	955	948	892	786	662	831	908	907	1046	883	918	818	705	983	860	911	686	611	651	561	442	552
622	754	934	1018	897	1064	957	964	962	936	846	748	593	906	895	1123	946	685	733	586	669	678	710	536	435	522	639	646	577	433	233	255	436	460	252	345
526	562	985	1126	896	1136	917	1013	1053	822	930	800	600	787	732	1160	877	600	860	571	502	733	685	835	604	777	939	806	941	776	668	573	525	632	479	300
598	642	982	1093	908	1175	941	997	1055	826	1140	985	914	1062	789	1090	839	584	912	756	963	1056	818	920	756	908	1021	853	1189	1028	808	1063	759	1063	738	370
844	760	1035	1112	951	1118	1011	1020	1055	923	1131	1054	1028	1153	964	1005	805	668	895	831	1072	1111	920	1042	922	1030	1100	929	1156	1054	1035	1172	972	1148	999	709
794	836	992	1093	1047	1037	1069	1065	1046	1038	1093	1101	1102	1103	1033	917	749	734	875	971	1070	1103	1049	1061	1020	1035	1040	1020	1080	1066	1064	1096	1046	1100	1019	843
859	832	944	1050	1073	1094	1100	1100	1105	1097	1119	1116	1124	1109	999	880	778	821	968	1039	1074	1078	1062	1062	1037	1033	1054	1059	1089	1089	1104	1114	1095	1135	1095	948
1006	918	935	998	1064	1148	1174	1187	1197	1181	1193	1176	1147	1098	992	934	923	982	1084	1109	1150	1164	1154	1163	1137	1136	1133	1132	1160	1171	1193	1210	1190	1210	1171	1090
1244	1179	1176	1154	1160	1221	1206	1238	1266	1225	1245	1229	1186	1180	1165	1171	1196	1250	1283	1296	1343	1327	1324	1367	1323	1335	1351	1313	1347	1353	1327	1354	1351	1344	1326	1296
439	431	427	425	413	417	414	412	410	408	419	414	417	425	422	425	431	439	446	454	466	465	464	468	469	465	473	466	467	467	467	469	462	465	455	442

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

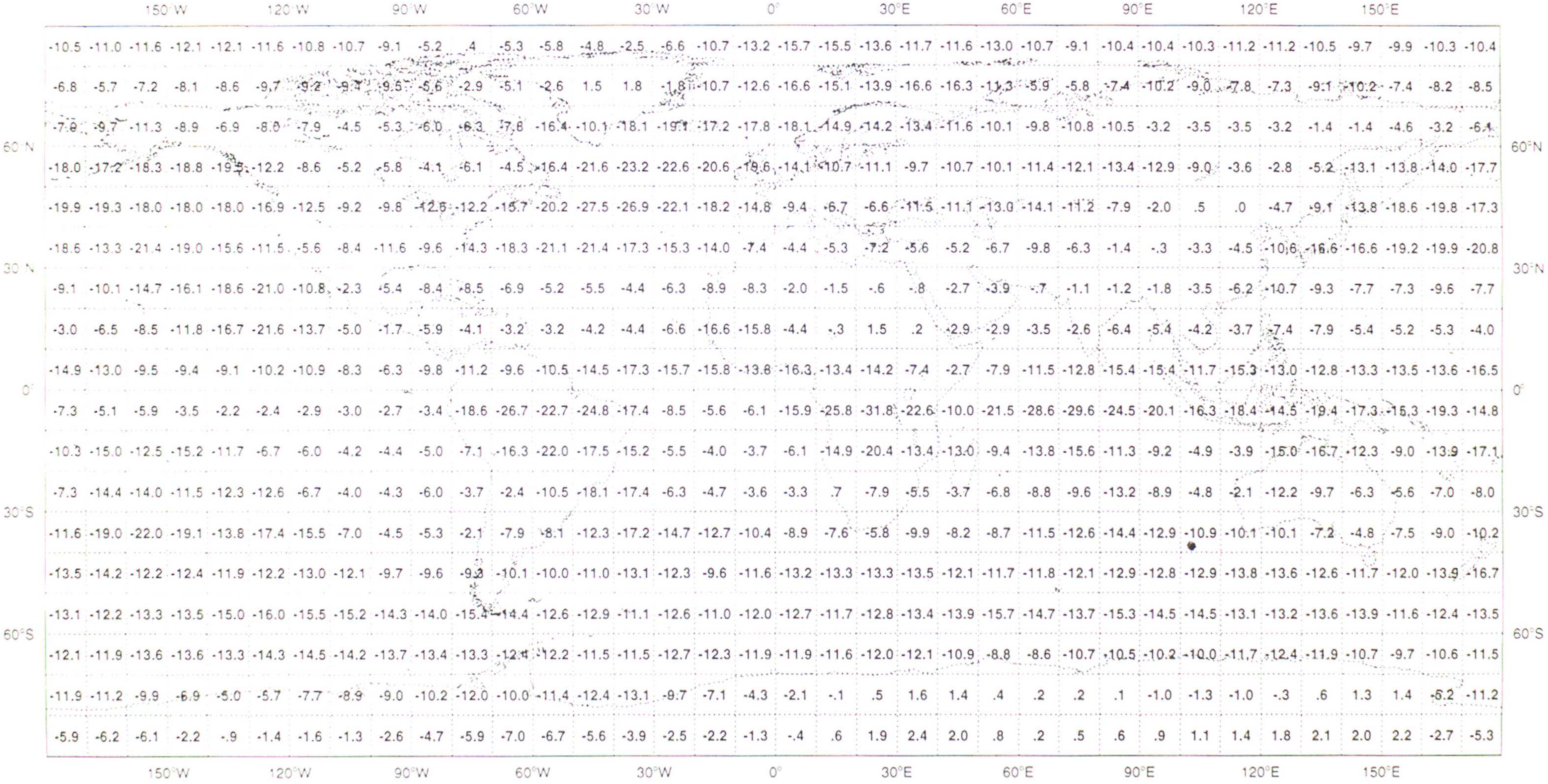


-.9	-.8	-.8	-.8	-.8	-.8	-.8	-.9	-.9	-1.0	-1.1	-1.3	-1.4	-1.6	-1.7	-2.0	-2.0	-2.0	-2.0	-1.9	-1.9	-1.8	-1.8	-1.8	-1.7	-1.6	-1.5	-1.4	-1.3	-1.2	-1.1	-1.1	-1.0	-1.1	-1.1	-.9
-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.5	-.6	-.7	-.9	-1.2	-1.5	-1.6	-1.8	-2.3	-2.5	-2.6	-2.6	-2.5	-2.4	-2.4	-2.1	-1.9	-1.7	-1.6	-1.6	-1.3	-1.1	-.8	-.6	-.5	-.4	-.5	-.5	-.5
-.6	-.9	-1.3	-1.5	-1.3	-1.1	-.8	-.6	-.5	-.4	-.6	-.9	-1.7	-2.2	-2.7	-3.1	-3.3	-3.4	-3.4	-3.5	-3.4	-3.0	-2.4	-2.1	-1.9	-1.8	-1.6	-1.2	-.9	-.6	-.4	-.2	-.2	-.4	-.4	-.4
-1.3	-1.5	-2.0	-2.2	-2.3	-2.2	-1.6	-1.3	-1.1	-.8	-.9	-.9	-1.2	-2.0	-2.7	-3.4	-3.4	-3.5	-3.4	-2.8	-2.9	-2.7	-2.2	-2.3	-2.2	-2.2	-2.3	-1.9	-1.5	-1.0	-.7	-.8	-.8	-1.2	-1.0	-.8
-2.3	-2.6	-2.8	-3.0	-3.1	-2.7	-2.5	-2.2	-2.2	-2.3	-2.2	-2.5	-2.9	-3.5	-3.9	-3.6	-3.4	-3.3	-3.0	-2.7	-2.3	-2.2	-2.2	-2.1	-2.3	-2.5	-2.3	-1.9	-1.7	-1.5	-1.2	-1.1	-1.2	-1.5	-1.8	-1.9
-3.0	-3.0	-3.7	-3.6	-3.6	-3.2	-3.0	-3.1	-3.4	-3.3	-3.2	-3.7	-4.3	-4.2	-4.2	-3.4	-3.3	-3.2	-2.4	-2.4	-2.2	-2.1	-2.3	-2.3	-3.0	-2.8	-2.2	-2.2	-2.3	-2.1	-2.3	-2.2	-2.3	-2.5	-2.9	-3.2
-3.1	-3.3	-3.7	-3.8	-4.2	-4.2	-3.7	-3.1	-3.2	-3.5	-3.2	-3.3	-3.3	-3.0	-3.0	-2.8	-3.4	-3.6	-2.8	-3.1	-2.7	-2.6	-2.9	-2.8	-3.0	-3.0	-2.8	-2.9	-2.8	-3.0	-3.2	-3.3	-3.5	-3.3	-3.4	-3.3
-3.4	-3.7	-3.7	-3.9	-4.4	-4.8	-4.3	-3.4	-3.2	-3.4	-3.2	-3.2	-3.2	-3.1	-3.2	-3.4	-4.4	-4.4	-3.6	-3.7	-3.9	-3.5	-3.4	-3.4	-3.7	-3.8	-4.0	-4.0	-3.6	-3.6	-3.9	-4.2	-4.1	-3.9	-4.0	-3.8
-5.0	-4.7	-4.1	-3.9	-3.9	-3.9	-4.0	-3.7	-3.5	-4.0	-4.4	-4.1	-4.1	-4.7	-4.8	-4.4	-4.5	-5.2	-6.1	-6.2	-6.2	-4.6	-4.1	-4.5	-5.2	-5.7	-5.7	-5.9	-4.9	-5.7	-5.3	-5.3	-5.6	-5.5	-5.5	-5.8
-4.5	-3.9	-3.8	-3.6	-3.2	-3.2	-3.2	-3.2	-3.3	-3.4	-5.5	-6.8	-5.9	-6.3	-5.2	-3.9	-3.6	-3.6	-5.5	-7.2	-8.4	-6.6	-4.6	-6.4	-7.6	-8.0	-7.4	-6.7	-5.9	-6.4	-5.7	-6.4	-6.3	-6.2	-6.6	-5.7
-4.9	-5.1	-4.7	-4.9	-4.2	-3.6	-3.2	-3.0	-3.2	-3.2	-4.4	-5.7	-6.2	-5.6	-4.7	-3.5	-3.2	-3.1	-3.7	-5.7	-6.9	-5.4	-5.0	-4.8	-5.5	-5.8	-5.0	-4.6	-3.9	-3.8	-6.0	-6.3	-5.0	-4.8	-6.1	-6.3
-3.8	-4.4	-4.4	-4.0	-3.8	-3.9	-3.1	-2.7	-2.8	-2.8	-3.1	-3.3	-3.9	-4.8	-4.4	-3.3	-3.1	-2.8	-3.1	-3.0	-3.9	-3.5	-3.1	-3.6	-3.5	-3.7	-4.0	-3.4	-3.1	-3.0	-3.6	-3.7	-3.2	-3.2	-3.4	-3.4
-3.2	-3.5	-4.6	-4.4	-3.3	-3.8	-3.4	-2.7	-2.5	-2.3	-2.4	-2.8	-2.7	-3.3	-3.5	-3.4	-3.1	-2.6	-2.7	-2.3	-2.6	-3.0	-2.6	-2.9	-2.9	-2.9	-3.2	-3.0	-3.0	-2.8	-2.9	-2.8	-2.6	-2.6	-2.7	-2.7
-2.4	-2.5	-2.4	-2.4	-2.2	-2.2	-2.4	-2.4	-2.1	-2.0	-2.0	-2.2	-2.1	-2.2	-2.6	-2.4	-1.8	-1.8	-1.9	-1.8	-2.0	-2.3	-2.3	-2.4	-2.2	-2.2	-2.1	-2.0	-1.9	-1.9	-2.0	-2.1	-2.1	-2.1	-2.3	-2.6
-1.4	-1.6	-1.4	-1.3	-1.3	-1.0	-1.2	-1.1	-1.1	-1.3	-1.2	-1.4	-1.3	-1.3	-1.6	-1.4	-1.1	-1.1	-.9	-1.0	-.9	-1.0	-1.3	-1.3	-1.4	-1.2	-1.0	-.9	-.7	-.7	-.9	-1.2	-1.6	-1.4	-1.6	-1.7
-.5	-.4	-.3	-.3	-.2	-.2	-.3	-.3	-.3	-.3	-.3	-.4	-.5	-.5	-.5	-.5	-.5	-.4	-.3	-.2	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	.0	-.2	-.4	-.5	-.7	-.6	-.7	-.7
-.1	.0	.0	.1	.1	.1	.1	.1	.1	.1	.0	.0	.0	.0	-.1	-.1	-.1	-.1	.1	.3	.4	.4	.4	.3	.2	.2	.4	.4	.3	.3	.3	.3	.2	.1	.0	-.1
.2	.2	.1	.1	.2	.2	.3	.4	.4	.3	.3	.3	.2	.2	.2	.2	.2	.2	.3	.3	.3	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.5	.4	.4	.3	.2

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002

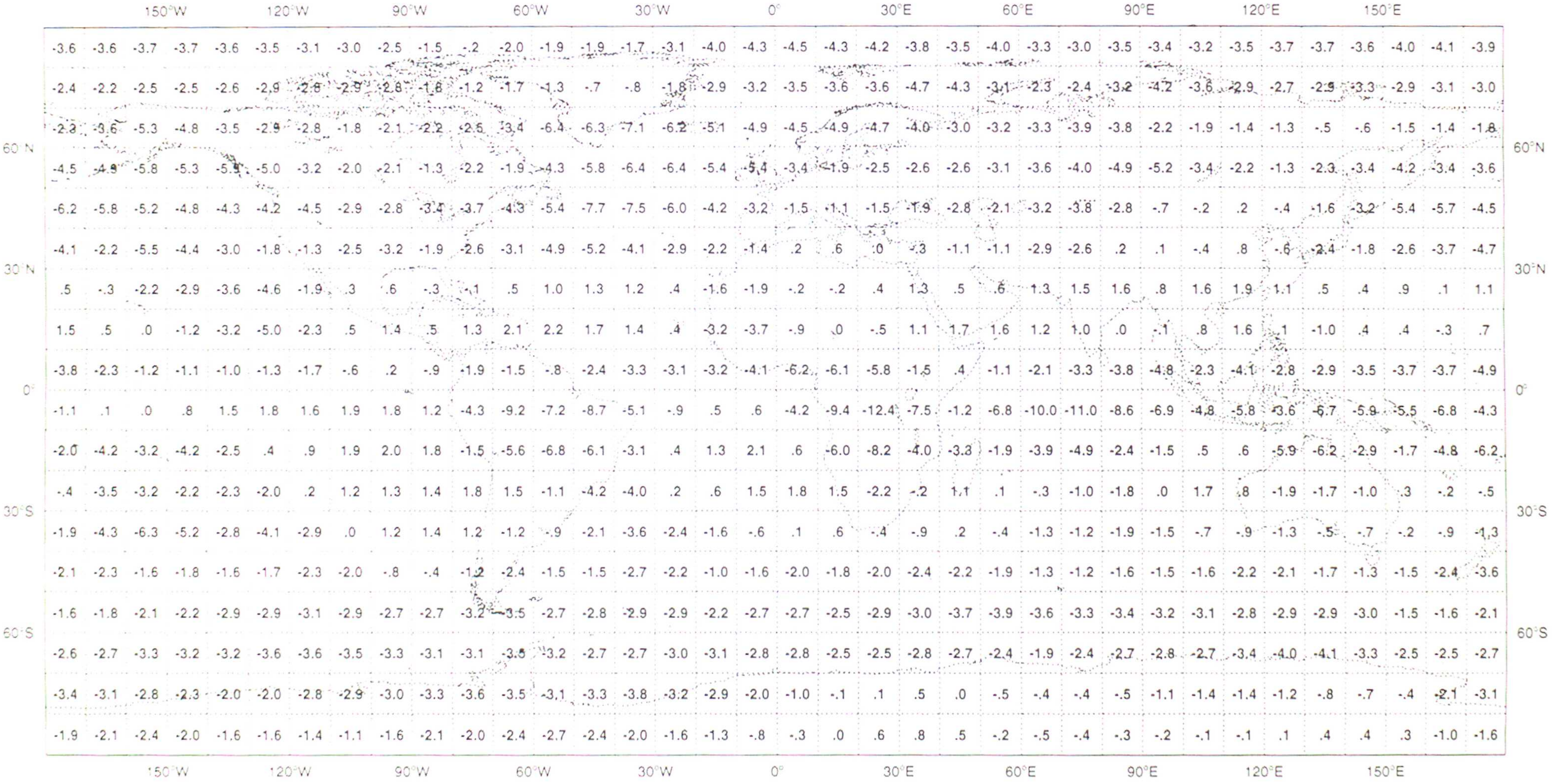
Channel: HIRS8 (Surface)

NOAA16, using all observations



-10.5	-11.0	-11.6	-12.1	-12.1	-11.6	-10.8	-10.7	-9.1	-5.2	.4	-5.3	-5.8	-4.8	-2.5	-6.6	-10.7	-13.2	-15.7	-15.5	-13.6	-11.7	-11.6	-13.0	-10.7	-9.1	-10.4	-10.4	-10.3	-11.2	-11.2	-10.5	-9.7	-9.9	-10.3	-10.4
-6.8	-5.7	-7.2	-8.1	-8.6	-9.7	-9.2	-9.4	-9.5	-5.6	-2.9	-5.1	-2.6	1.5	1.8	-1.8	-10.7	-12.6	-16.6	-15.1	-13.9	-16.6	-16.3	-11.3	-5.9	-5.8	-7.4	-10.2	-9.0	-7.8	-7.3	-9.1	-10.2	-7.4	-8.2	-8.5
-7.8	-9.7	-11.3	-8.9	-6.9	-8.0	-7.9	-4.5	-5.3	-6.0	-6.3	-7.8	-16.4	-10.1	-18.1	-19.1	-17.2	-17.8	-18.1	-14.9	-14.2	-13.4	-11.6	-10.1	-9.8	-10.8	-10.5	-3.2	-3.5	-3.5	-3.2	-1.4	-1.4	-4.6	-3.2	-6.1
-18.0	-17.2	-18.3	-18.8	-19.5	-12.2	-8.6	-5.2	-5.8	-4.1	-6.1	-4.5	-16.4	-21.6	-23.2	-22.6	-20.6	-19.6	-14.1	-10.7	-11.1	-9.7	-10.7	-10.1	-11.4	-12.1	-13.4	-12.9	-9.0	-3.6	-2.8	-5.2	-13.1	-13.8	-14.0	-17.7
-19.9	-19.3	-18.0	-18.0	-18.0	-16.9	-12.5	-9.2	-9.8	-12.6	-12.2	-15.7	-20.2	-27.5	-26.9	-22.1	-18.2	-14.8	-9.4	-6.7	-6.6	-11.5	-11.1	-13.0	-14.1	-11.2	-7.9	-2.0	.5	.0	-4.7	-9.1	-13.8	-18.6	-19.8	-17.3
-18.6	-13.3	-21.4	-19.0	-15.6	-11.5	-5.6	-8.4	-11.6	-9.6	-14.3	-18.3	-21.1	-21.4	-17.3	-15.3	-14.0	-7.4	-4.4	-5.3	-7.2	-5.6	-5.2	-6.7	-9.8	-6.3	-1.4	-.3	-3.3	-4.5	-10.6	-16.6	-16.6	-19.2	-19.9	-20.8
-9.1	-10.1	-14.7	-16.1	-18.6	-21.0	-10.8	-2.3	-5.4	-8.4	-8.5	-6.9	-5.2	-5.5	-4.4	-6.3	-8.9	-8.3	-2.0	-1.5	-.6	-.8	-2.7	-3.9	-.7	-1.1	-1.2	-1.8	-3.5	-6.2	-10.7	-9.3	-7.7	-7.3	-9.6	-7.7
-3.0	-6.5	-8.5	-11.8	-16.7	-21.6	-13.7	-5.0	-1.7	-5.9	-4.1	-3.2	-3.2	-4.2	-4.4	-6.6	-16.6	-15.8	-4.4	-.3	1.5	.2	-2.9	-2.9	-3.5	-2.6	-6.4	-5.4	-4.2	-3.7	-7.4	-7.9	-5.4	-5.2	-5.3	-4.0
-14.9	-13.0	-9.5	-9.4	-9.1	-10.2	-10.9	-8.3	-6.3	-9.8	-11.2	-9.6	-10.5	-14.5	-17.3	-15.7	-15.8	-13.8	-16.3	-13.4	-14.2	-7.4	-2.7	-7.9	-11.5	-12.8	-15.4	-15.4	-11.7	-15.3	-13.0	-12.8	-13.3	-13.5	-13.6	-16.5
-7.3	-5.1	-5.9	-3.5	-2.2	-2.4	-2.9	-3.0	-2.7	-3.4	-18.6	-26.7	-22.7	-24.8	-17.4	-8.5	-5.6	-6.1	-15.9	-25.8	-31.8	-22.6	-10.0	-21.5	-28.6	-29.6	-24.5	-20.1	-16.3	-18.4	-14.5	-19.4	-17.3	-15.3	-19.3	-14.8
-10.3	-15.0	-12.5	-15.2	-11.7	-6.7	-6.0	-4.2	-4.4	-5.0	-7.1	-16.3	-22.0	-17.5	-15.2	-5.5	-4.0	-3.7	-6.1	-14.9	-20.4	-13.4	-13.0	-9.4	-13.8	-15.6	-11.3	-9.2	-4.9	-3.9	-15.0	-16.7	-12.3	-9.0	-13.9	-17.1
-7.3	-14.4	-14.0	-11.5	-12.3	-12.6	-6.7	-4.0	-4.3	-6.0	-3.7	-2.4	-10.5	-18.1	-17.4	-6.3	-4.7	-3.6	-3.3	.7	-7.9	-5.5	-3.7	-6.8	-8.8	-9.6	-13.2	-8.9	-4.8	-2.1	-12.2	-9.7	-6.3	-5.6	-7.0	-8.0
-11.6	-19.0	-22.0	-19.1	-13.8	-17.4	-15.5	-7.0	-4.5	-5.3	-2.1	-7.9	-8.1	-12.3	-17.2	-14.7	-12.7	-10.4	-8.9	-7.6	-5.8	-9.9	-8.2	-8.7	-11.5	-12.6	-14.4	-12.9	-10.9	-10.1	-10.1	-7.2	-4.8	-7.5	-9.0	-10.2
-13.5	-14.2	-12.2	-12.4	-11.9	-12.2	-13.0	-12.1	-9.7	-9.6	-9.3	-10.1	-10.0	-11.0	-13.1	-12.3	-9.6	-11.6	-13.2	-13.3	-13.3	-13.5	-12.1	-11.7	-11.8	-12.1	-12.9	-12.8	-12.9	-13.8	-13.6	-12.6	-11.7	-12.0	-13.9	-16.7
-13.1	-12.2	-13.3	-13.5	-15.0	-16.0	-15.5	-15.2	-14.3	-14.0	-15.4	-14.4	-12.6	-12.9	-11.1	-12.6	-11.0	-12.0	-12.7	-11.7	-12.8	-13.4	-13.9	-15.7	-14.7	-13.7	-15.3	-14.5	-14.5	-13.1	-13.2	-13.6	-13.9	-11.6	-12.4	-13.5
-12.1	-11.9	-13.6	-13.6	-13.3	-14.3	-14.5	-14.2	-13.7	-13.4	-13.3	-12.4	-12.2	-11.5	-11.5	-12.7	-12.3	-11.9	-11.9	-11.6	-12.0	-12.1	-10.9	-8.8	-8.6	-10.7	-10.5	-10.2	-10.0	-11.7	-12.4	-11.9	-10.7	-9.7	-10.6	-11.5
-11.9	-11.2	-9.9	-6.9	-5.0	-5.7	-7.7	-8.9	-9.0	-10.2	-12.0	-10.0	-11.4	-12.4	-13.1	-9.7	-7.1	-4.3	-2.1	-.1	.5	1.6	1.4	.4	.2	.2	.1	-1.0	-1.3	-1.0	-.3	.6	1.3	1.4	-5.2	-11.2
-5.9	-6.2	-6.1	-2.2	-.9	-1.4	-1.6	-1.3	-2.6	-4.7	-5.9	-7.0	-6.7	-5.6	-3.9	-2.5	-2.2	-1.3	-.4	.6	1.9	2.4	2.0	.8	.2	.5	.6	.9	1.1	1.4	1.8	2.1	2.0	2.2	-2.7	-5.3

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-3.6	-3.6	-3.7	-3.7	-3.6	-3.5	-3.1	-3.0	-2.5	-1.5	-.2	-2.0	-1.9	-1.9	-1.7	-3.1	-4.0	-4.3	-4.5	-4.3	-4.2	-3.8	-3.5	-4.0	-3.3	-3.0	-3.5	-3.4	-3.2	-3.5	-3.7	-3.7	-3.6	-4.0	-4.1	-3.9
-2.4	-2.2	-2.5	-2.5	-2.6	-2.9	-2.8	-2.9	-2.8	-1.8	-1.2	-1.7	-1.3	-.7	-.8	-1.8	-2.9	-3.2	-3.5	-3.6	-3.6	-4.7	-4.3	-3.1	-2.3	-2.4	-3.2	-4.2	-3.6	-2.9	-2.7	-2.9	-3.3	-2.9	-3.1	-3.0
-2.3	-3.6	-5.3	-4.8	-3.5	-2.9	-2.8	-1.8	-2.1	-2.2	-2.5	-3.4	-6.4	-6.3	-7.1	-6.2	-5.1	-4.9	-4.5	-4.9	-4.7	-4.0	-3.0	-3.2	-3.3	-3.9	-3.8	-2.2	-1.9	-1.4	-1.3	-.5	-.6	-1.5	-1.4	-1.8
-4.5	-4.9	-5.8	-5.3	-5.9	-5.0	-3.2	-2.0	-2.1	-1.3	-2.2	-1.9	-4.3	-5.8	-6.4	-6.4	-5.4	-5.4	-3.4	-1.9	-2.5	-2.6	-2.6	-3.1	-3.6	-4.0	-4.9	-5.2	-3.4	-2.2	-1.3	-2.3	-3.4	-4.2	-3.4	-3.6
-6.2	-5.8	-5.2	-4.8	-4.3	-4.2	-4.5	-2.9	-2.8	-3.4	-3.7	-4.3	-5.4	-7.7	-7.5	-6.0	-4.2	-3.2	-1.5	-1.1	-1.5	-1.9	-2.8	-2.1	-3.2	-3.8	-2.8	-.7	-.2	.2	-.4	-1.6	-3.2	-5.4	-5.7	-4.5
-4.1	-2.2	-5.5	-4.4	-3.0	-1.8	-1.3	-2.5	-3.2	-1.9	-2.6	-3.1	-4.9	-5.2	-4.1	-2.9	-2.2	-1.4	.2	.6	.0	-.3	-1.1	-1.1	-2.9	-2.6	.2	.1	-.4	.8	-.6	-2.4	-1.8	-2.6	-3.7	-4.7
.5	-.3	-2.2	-2.9	-3.6	-4.6	-1.9	.3	.6	-.3	-.1	.5	1.0	1.3	1.2	.4	-1.6	-1.9	-.2	-.2	.4	1.3	.5	.6	1.3	1.5	1.6	.8	1.6	1.9	1.1	.5	.4	.9	.1	1.1
1.5	.5	.0	-1.2	-3.2	-5.0	-2.3	.5	1.4	.5	1.3	2.1	2.2	1.7	1.4	.4	-3.2	-3.7	-.9	.0	-.5	1.1	1.7	1.6	1.2	1.0	.0	-.1	.8	1.6	.1	-1.0	.4	.4	-.3	.7
-3.8	-2.3	-1.2	-1.1	-1.0	-1.3	-1.7	-.6	.2	-.9	-1.9	-1.5	-.8	-2.4	-3.3	-3.1	-3.2	-4.1	-6.2	-6.1	-5.8	-1.5	.4	-1.1	-2.1	-3.3	-3.8	-4.8	-2.3	-4.1	-2.8	-2.9	-3.5	-3.7	-3.7	-4.9
-1.1	.1	.0	.8	1.5	1.8	1.6	1.9	1.8	1.2	-4.3	-9.2	-7.2	-8.7	-5.1	-.9	.5	.6	-4.2	-9.4	-12.4	-7.5	-1.2	-6.8	-10.0	-11.0	-8.6	-6.9	-4.8	-5.8	-3.6	-6.7	-5.9	-5.5	-6.8	-4.3
-2.0	-4.2	-3.2	-4.2	-2.5	.4	.9	1.9	2.0	1.8	-1.5	-5.6	-6.8	-6.1	-3.1	.4	1.3	2.1	.6	-6.0	-8.2	-4.0	-3.3	-1.9	-3.9	-4.9	-2.4	-1.5	.5	.6	-5.9	-6.2	-2.9	-1.7	-4.8	-6.2
-.4	-3.5	-3.2	-2.2	-2.3	-2.0	.2	1.2	1.3	1.4	1.8	1.5	-1.1	-4.2	-4.0	.2	.6	1.5	1.8	1.5	-2.2	-.2	1.1	.1	-.3	-1.0	-1.8	.0	1.7	.8	-1.9	-1.7	-1.0	.3	-.2	-.5
-1.9	-4.3	-6.3	-5.2	-2.8	-4.1	-2.9	.0	1.2	1.4	1.2	-1.2	-.9	-2.1	-3.6	-2.4	-1.6	-.6	.1	.6	-.4	-.9	.2	-.4	-1.3	-1.2	-1.9	-1.5	-.7	-.9	-1.3	-.5	-.7	-.2	-.9	-1.3
-2.1	-2.3	-1.6	-1.8	-1.6	-1.7	-2.3	-2.0	-.8	-.4	-1.2	-2.4	-1.5	-1.5	-2.7	-2.2	-1.0	-1.6	-2.0	-1.8	-2.0	-2.4	-2.2	-1.9	-1.3	-1.2	-1.6	-1.5	-1.6	-2.2	-2.1	-1.7	-1.3	-1.5	-2.4	-3.6
-1.6	-1.8	-2.1	-2.2	-2.9	-2.9	-3.1	-2.9	-2.7	-2.7	-3.2	-3.5	-2.7	-2.8	-2.9	-2.9	-2.2	-2.7	-2.7	-2.5	-2.9	-3.0	-3.7	-3.9	-3.6	-3.3	-3.4	-3.2	-3.1	-2.8	-2.9	-2.9	-3.0	-1.5	-1.6	-2.1
-2.6	-2.7	-3.3	-3.2	-3.2	-3.6	-3.6	-3.5	-3.3	-3.1	-3.1	-3.5	-3.2	-2.7	-2.7	-3.0	-3.1	-2.8	-2.8	-2.5	-2.5	-2.8	-2.7	-2.4	-1.9	-2.4	-2.7	-2.8	-2.7	-3.4	-4.0	-4.1	-3.3	-2.5	-2.5	-2.7
-3.4	-3.1	-2.8	-2.3	-2.0	-2.0	-2.8	-2.9	-3.0	-3.3	-3.6	-3.5	-3.1	-3.3	-3.8	-3.2	-2.9	-2.0	-1.0	-.1	.1	.5	.0	-.5	-.4	-.4	-.5	-1.1	-1.4	-1.4	-1.2	-.8	-.7	-.4	-2.1	-3.1
-1.9	-2.1	-2.4	-2.0	-1.6	-1.6	-1.4	-1.1	-1.6	-2.1	-2.0	-2.4	-2.7	-2.4	-2.0	-1.6	-1.3	-.8	-.3	.0	.6	.8	.5	-.2	-.5	-.4	-.3	-.2	-.1	-.1	.1	.4	.4	.3	-1.0	-1.6

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002

Channel: HIRS15 (700 hPa)

NOAA16, using all observations

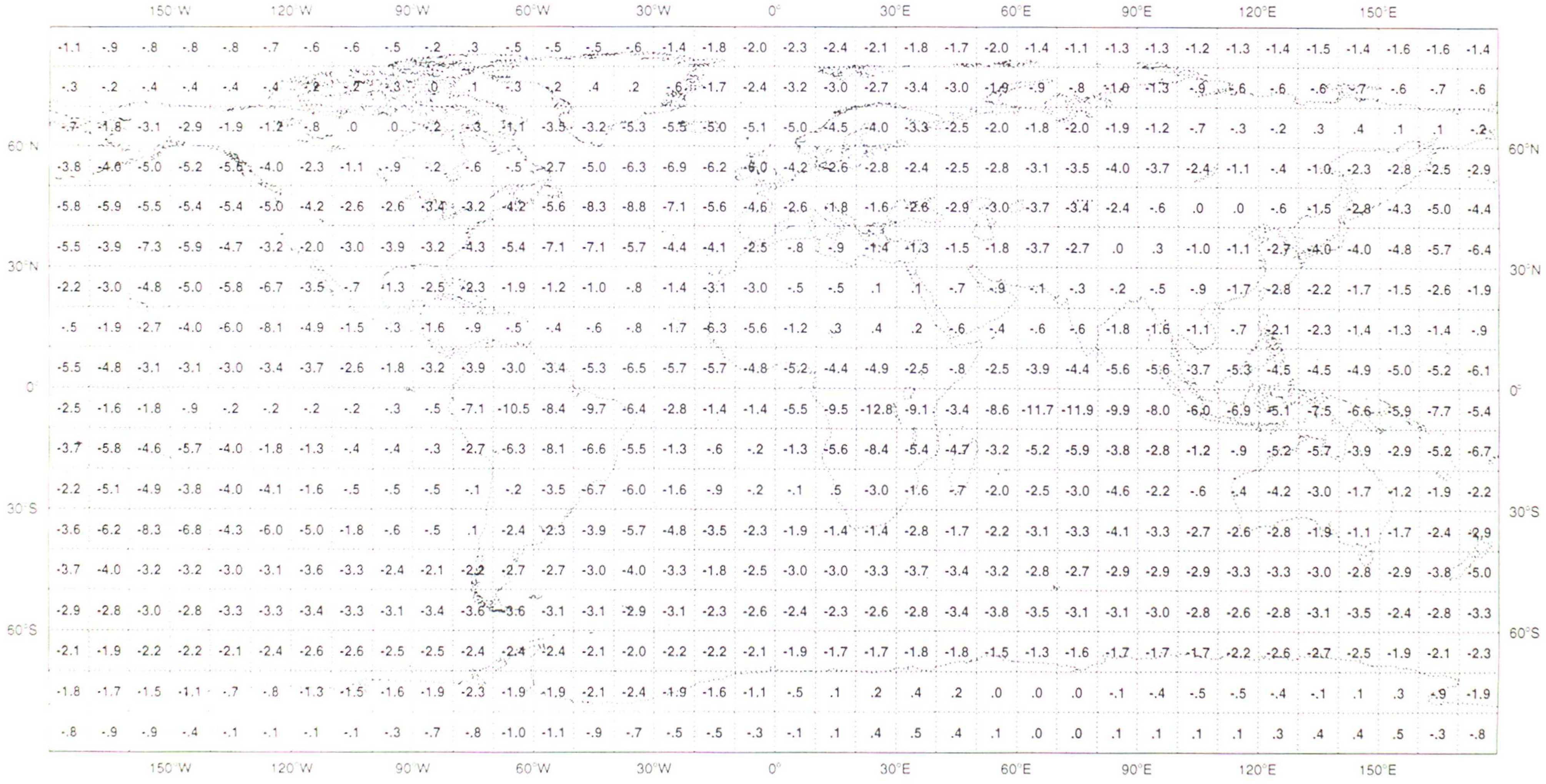
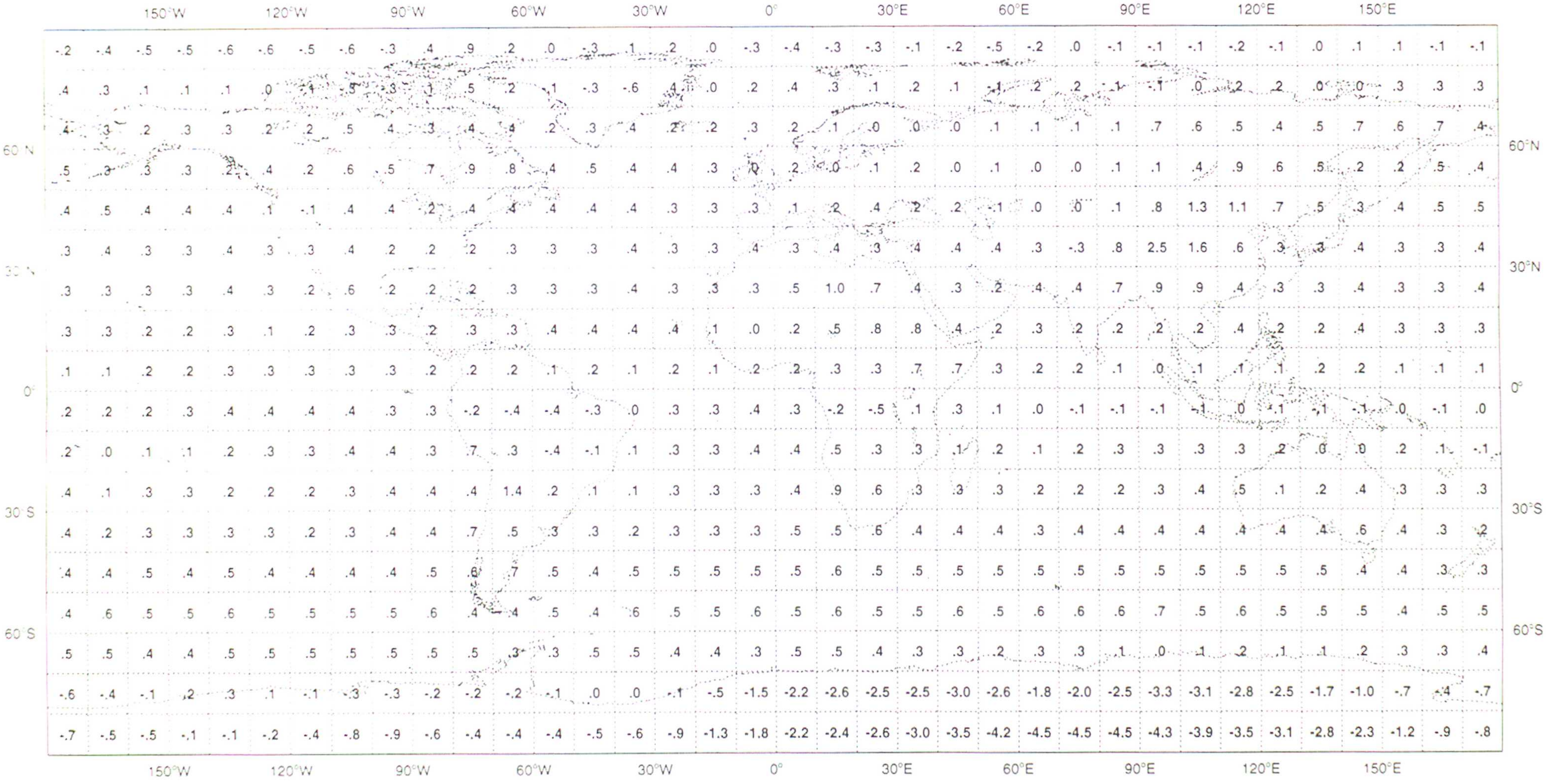

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.1 -.9 -.8 -.8 -.8 -.7 -.6 -.6 -.5 -.2 .3 -.5 -.5 -.5 -.6 -1.4 -1.8 -2.0 -2.3 -2.4 -2.1 -1.8 -1.7 -2.0 -1.4 -1.1 -1.3 -1.3 -1.2 -1.3 -1.4 -1.5 -1.4 -1.6 -1.6 -1.4
-.3 -.2 -.4 -.4 -.4 -.4 -.2 -.2 -.3 .0 .1 -.3 -.2 .4 .2 -.6 -1.7 -2.4 -3.2 -3.0 -2.7 -3.4 -3.0 -1.0 -.9 -.8 -1.0 -1.3 -.9 -.6 -.6 -.6 -.7 -.6 -.7 -.6
-.7 -1.8 -3.1 -2.9 -1.9 -1.2 -.8 .0 .0 -.2 -.3 -1.1 -3.5 -3.2 -5.3 -5.5 -5.0 -5.1 -5.0 -4.5 -4.0 -3.3 -2.5 -2.0 -1.8 -2.0 -1.9 -1.2 -.7 -.3 -.2 .3 .4 .1 .1 -.2
-3.8 -4.0 -5.0 -5.2 -5.6 -4.0 -2.3 -1.1 -.9 -.2 -.6 -.5 -2.7 -5.0 -6.3 -6.9 -6.2 -6.0 -4.2 -2.6 -2.8 -2.4 -2.5 -2.8 -3.1 -3.5 -4.0 -3.7 -2.4 -1.1 -.4 -1.0 -2.3 -2.8 -2.5 -2.9
-5.8 -5.9 -5.5 -5.4 -5.4 -5.0 -4.2 -2.6 -2.6 -3.4 -3.2 -4.2 -5.6 -8.3 -8.8 -7.1 -5.6 -4.6 -2.6 -1.8 -1.6 -2.6 -2.9 -3.0 -3.7 -3.4 -2.4 -.6 .0 .0 -.6 -1.5 -2.8 -4.3 -5.0 -4.4
-5.5 -3.9 -7.3 -5.9 -4.7 -3.2 -2.0 -3.0 -3.9 -3.2 -4.3 -5.4 -7.1 -7.1 -5.7 -4.4 -4.1 -2.5 -.8 -.9 -1.4 -1.3 -1.5 -1.8 -3.7 -2.7 .0 .3 -1.0 -1.1 -2.7 -4.0 -4.0 -4.8 -5.7 -6.4
-2.2 -3.0 -4.8 -5.0 -5.8 -6.7 -3.5 -.7 -1.3 -2.5 -2.3 -1.9 -1.2 -1.0 -.8 -1.4 -3.1 -3.0 -.5 -.5 .1 .1 -.7 -.9 -.1 -.3 -.2 -.5 -.9 -1.7 -2.8 -2.2 -1.7 -1.5 -2.6 -1.9
-.5 -1.9 -2.7 -4.0 -6.0 -8.1 -4.9 -1.5 -.3 -1.6 -.9 -.5 -.4 -.6 -.8 -1.7 -6.3 -5.6 -1.2 .3 .4 .2 -.6 -.4 -.6 -.6 -1.8 -1.6 -1.1 -.7 -2.1 -2.3 -1.4 -1.3 -1.4 -.9
-5.5 -4.8 -3.1 -3.1 -3.0 -3.4 -3.7 -2.6 -1.8 -3.2 -3.9 -3.0 -3.4 -5.3 -6.5 -5.7 -5.7 -4.8 -5.2 -4.4 -4.9 -2.5 -.8 -2.5 -3.9 -4.4 -5.6 -5.6 -3.7 -5.3 -4.5 -4.5 -4.9 -5.0 -5.2 -6.1
-2.5 -1.6 -1.8 -.9 -.2 -.2 -.2 -.2 -.3 -.5 -7.1 -10.5 -8.4 -9.7 -6.4 -2.8 -1.4 -1.4 -5.5 -9.5 -12.8 -9.1 -3.4 -8.6 -11.7 -11.9 -9.9 -8.0 -6.0 -6.9 -5.1 -7.5 -6.6 -5.9 -7.7 -5.4
-3.7 -5.8 -4.6 -5.7 -4.0 -1.8 -1.3 -.4 -.4 -.3 -2.7 -6.3 -8.1 -6.6 -5.5 -1.3 -.6 -.2 -1.3 -5.6 -8.4 -5.4 -4.7 -3.2 -5.2 -5.9 -3.8 -2.8 -1.2 -.9 -5.2 -5.7 -3.9 -2.9 -5.2 -6.7
-2.2 -5.1 -4.9 -3.8 -4.0 -4.1 -1.6 -.5 -.5 -.5 -.1 -.2 -3.5 -6.7 -6.0 -1.6 -.9 -.2 -.1 .5 -3.0 -1.6 -.7 -2.0 -2.5 -3.0 -4.6 -2.2 -.6 -.4 -4.2 -3.0 -1.7 -1.2 -1.9 -2.2
-3.6 -6.2 -8.3 -6.8 -4.3 -6.0 -5.0 -1.8 -.6 -.5 .1 -2.4 -2.3 -3.9 -5.7 -4.8 -3.5 -2.3 -1.9 -1.4 -1.4 -2.8 -1.7 -2.2 -3.1 -3.3 -4.1 -3.3 -2.7 -2.6 -2.8 -1.9 -1.1 -1.7 -2.4 -2.9
-3.7 -4.0 -3.2 -3.2 -3.0 -3.1 -3.6 -3.3 -2.4 -2.1 -2.2 -2.7 -2.7 -3.0 -4.0 -3.3 -1.8 -2.5 -3.0 -3.0 -3.3 -3.7 -3.4 -3.2 -2.8 -2.7 -2.9 -2.9 -2.9 -3.3 -3.3 -3.0 -2.8 -2.9 -3.8 -5.0
-2.9 -2.8 -3.0 -2.8 -3.3 -3.3 -3.4 -3.3 -3.1 -3.4 -3.6 -3.6 -3.1 -3.1 -2.9 -3.1 -2.3 -2.6 -2.4 -2.3 -2.6 -2.8 -3.4 -3.8 -3.5 -3.1 -3.1 -3.0 -2.8 -2.6 -2.8 -3.1 -3.5 -2.4 -2.8 -3.3
-2.1 -1.9 -2.2 -2.2 -2.1 -2.4 -2.6 -2.6 -2.5 -2.5 -2.4 -2.4 -2.4 -2.1 -2.0 -2.2 -2.2 -2.1 -1.9 -1.7 -1.7 -1.8 -1.8 -1.5 -1.3 -1.6 -1.7 -1.7 -1.7 -2.2 -2.6 -2.7 -2.5 -1.9 -2.1 -2.3
-1.8 -1.7 -1.5 -1.1 -.7 -.8 -1.3 -1.5 -1.6 -1.9 -2.3 -1.9 -1.9 -2.1 -2.4 -1.9 -1.6 -1.1 -.5 .1 .2 .4 .2 .0 .0 .0 -.1 -.4 -.5 -.5 -.4 -.1 .1 .3 -.9 -1.9
-.8 -.9 -.9 -.4 -.1 -.1 -.1 -.1 -.3 -.7 -.8 -1.0 -1.1 -.9 -.7 -.5 -.5 -.3 -.1 .1 .4 .5 .4 .1 .0 .0 .1 .1 .1 .1 .3 .4 .4 .5 -.3 -.8

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



-.2	-.4	-.5	-.5	-.6	-.6	-.5	-.6	-.3	.4	.9	.2	.0	-.3	.1	.2	.0	-.3	-.4	-.3	-.3	-.1	-.2	-.5	-.2	.0	-.1	-.1	-.1	-.2	-.1	.0	.1	.1	-.1	-.1
.4	.3	.1	.1	.1	.0	.1	.5	.3	.1	.5	.2	-.1	-.3	-.6	.4	.0	.2	.4	.3	.1	.2	.1	-.1	.2	.2	-.1	-.1	.0	.2	.2	.0	.0	.3	.3	.3
.4	.3	.2	.3	.3	.2	.2	.5	.4	.3	.4	.4	.2	.3	.4	.2	.2	.3	.2	.1	.0	.0	.0	.1	.1	.1	.1	.7	.6	.5	.4	.5	.7	.6	.7	.4
.5	.3	.3	.3	.2	.4	.2	.6	.5	.7	.9	.8	.4	.5	.4	.4	.3	.0	.2	.0	.1	.2	.0	.1	.0	.0	.1	.1	.4	.9	.6	.5	.2	.2	.5	.4
.4	.5	.4	.4	.4	.1	-.1	.4	.4	.2	.4	.4	.4	.4	.4	.3	.3	.3	.1	.2	.4	.2	.2	-.1	.0	.0	.1	.8	1.3	1.1	.7	.5	.3	.4	.5	.5
.3	.4	.3	.3	.4	.3	.3	.4	.2	.2	.2	.3	.3	.3	.4	.3	.3	.4	.3	.4	.3	.4	.4	.4	.3	-.3	.8	2.5	1.6	.6	.3	.3	.4	.3	.3	.4
.3	.3	.3	.3	.4	.3	.2	.6	.2	.2	.2	.3	.3	.3	.4	.3	.3	.3	.5	1.0	.7	.4	.3	.2	.4	.4	.7	.9	.9	.4	.3	.3	.4	.3	.3	.4
.3	.3	.2	.2	.3	.1	.2	.3	.3	.2	.3	.3	.4	.4	.4	.4	.1	.0	.2	.5	.8	.8	.4	.2	.3	.2	.2	.2	.2	.4	.2	.2	.4	.3	.3	.3
.1	.1	.2	.2	.3	.3	.3	.3	.3	.2	.2	.2	.1	.2	.1	.2	.1	.2	.2	.3	.3	.7	.7	.3	.2	.2	.1	.0	.1	.1	.1	.2	.2	.1	.1	.1
.2	.2	.2	.3	.4	.4	.4	.4	.3	.3	-.2	-.4	-.4	-.3	.0	.3	.3	.4	.3	-.2	-.5	.1	.3	.1	.0	-.1	-.1	-.1	-.1	.0	-.1	-.1	-.1	.0	-.1	.0
.2	.0	.1	.1	.2	.3	.3	.4	.4	.3	.7	.3	-.4	-.1	.1	.3	.3	.4	.4	.5	.3	.3	.1	.2	.1	.2	.3	.3	.3	.3	.2	.0	.0	.2	.1	-.1
.4	.1	.3	.3	.2	.2	.2	.3	.4	.4	.4	1.4	.2	.1	.1	.3	.3	.3	.4	.9	.6	.3	.3	.3	.2	.2	.2	.3	.4	.5	.1	.2	.4	.3	.3	.3
.4	.2	.3	.3	.3	.3	.2	.3	.4	.4	.7	.5	.3	.3	.2	.3	.3	.3	.5	.5	.6	.4	.4	.4	.3	.4	.4	.4	.4	.4	.4	.4	.6	.4	.3	.2
.4	.4	.5	.4	.5	.4	.4	.4	.4	.5	.6	.7	.5	.4	.5	.5	.5	.5	.5	.6	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.4	.4	.3	.3
.4	.6	.5	.5	.6	.5	.5	.5	.5	.6	.4	.4	.5	.4	.6	.5	.5	.6	.5	.6	.5	.5	.6	.5	.6	.6	.6	.7	.5	.6	.5	.5	.5	.4	.5	.5
.5	.5	.4	.4	.5	.5	.5	.5	.5	.5	.5	.3	.3	.5	.5	.4	.4	.3	.5	.5	.4	.3	.3	.2	.3	.3	.1	.0	.1	.2	.1	.1	.2	.3	.3	.4
-.6	-.4	-.1	.2	.3	.1	-.1	-.3	-.3	-.2	-.2	-.2	-.1	.0	.0	-.1	-.5	-1.5	-2.2	-2.6	-2.5	-2.5	-3.0	-2.6	-1.8	-2.0	-2.5	-3.3	-3.1	-2.8	-2.5	-1.7	-1.0	-.7	-.4	-.7
-.7	-.5	-.5	-.1	-.1	-.2	-.4	-.8	-.9	-.6	-.4	-.4	-.4	-.5	-.6	-.9	-1.3	-1.8	-2.2	-2.4	-2.6	-3.0	-3.5	-4.2	-4.5	-4.5	-4.5	-4.3	-3.9	-3.5	-3.1	-2.8	-2.3	-1.2	-.9	-.8

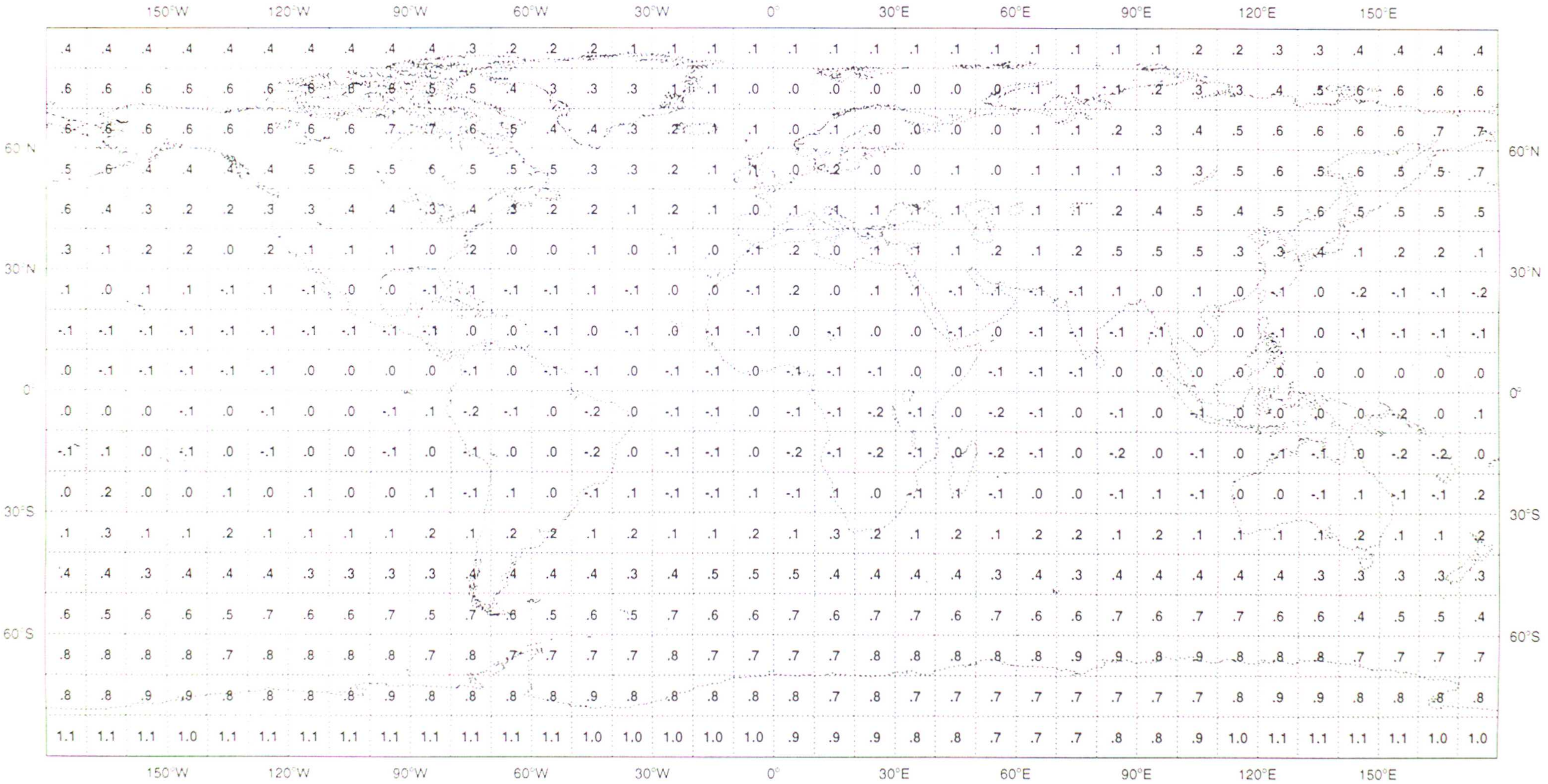


Figure 46. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

.4	.4	.4	.4	.4	.4	.4	.4	.4	.4	.3	.2	.2	.2	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.2	.2	.3	.3	.4	.4	.4	.4
.6	.6	.6	.6	.6	.6	.6	.6	.6	.5	.5	.4	.3	.3	.3	.1	.1	.0	.0	.0	.0	.0	.0	.0	.1	.1	.1	.2	.3	.3	.4	.5	.6	.6	.6	.6
.6	.6	.6	.6	.6	.6	.6	.6	.7	.7	.6	.5	.4	.4	.3	.2	.1	.1	.0	.1	.0	.0	.0	.0	.1	.1	.2	.3	.4	.5	.6	.6	.6	.6	.7	.7
.5	.6	.4	.4	.4	.4	.5	.5	.5	.6	.5	.5	.5	.3	.3	.2	.1	.1	.0	.2	.0	.0	.1	.0	.1	.1	.1	.3	.3	.5	.6	.5	.6	.5	.5	.7
.6	.4	.3	.2	.2	.3	.3	.4	.4	.3	.4	.3	.2	.2	.1	.2	.1	.0	.1	.1	.1	.1	.1	.1	.1	.1	.2	.4	.5	.4	.5	.6	.5	.5	.5	.5
.3	.1	.2	.2	.0	.2	.1	.1	.1	.0	.2	.0	.0	.1	.0	.1	.0	-.1	.2	.0	.1	.1	.1	.2	.1	.2	.5	.5	.5	.3	.3	.4	.1	.2	.2	.1
.1	.0	.1	.1	-.1	.1	-.1	.0	.0	-.1	.1	-.1	-.1	.1	-.1	.0	.0	-.1	.2	.0	.1	.1	-.1	.1	-.1	-.1	.1	.0	.1	.0	-.1	.0	-.2	-.1	-.1	-.2
-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	-.1	.0	.0	-.1	.0	-.1	.0	-.1	-.1	.0	-.1	.0	.0	-.1	.0	-.1	-.1	-.1	-.1	.0	.0	-.1	.0	-.1	-.1	-.1	-.1
.0	-.1	-.1	-.1	-.1	-.1	.0	.0	.0	.0	-.1	.0	-.1	-.1	.0	-.1	-.1	.0	-.1	-.1	-.1	.0	.0	-.1	-.1	-.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
.0	.0	.0	-.1	.0	-.1	.0	.0	-.1	.1	-.2	-.1	.0	-.2	.0	-.1	-.1	.0	-.1	-.1	-.2	-.1	.0	-.2	-.1	.0	-.1	.0	-.1	.0	.0	.0	.0	-.2	.0	.1
-.1	.1	.0	-.1	.0	-.1	.0	.0	-.1	.0	-.1	.0	.0	-.2	.0	-.1	-.1	.0	-.2	-.1	-.2	-.1	.0	-.2	-.1	.0	-.2	.0	-.1	.0	-.1	-.1	.0	-.2	-.2	.0
.0	.2	.0	.0	.1	.0	.1	.0	.0	.1	-.1	.1	.0	-.1	.1	-.1	-.1	.1	-.1	.1	.0	-.1	.1	-.1	.0	.0	-.1	.1	-.1	.0	.0	-.1	.1	-.1	-.1	.2
.1	.3	.1	.1	.2	.1	.1	.1	.1	.2	.1	.2	.2	.1	.2	.1	.1	.2	.1	.3	.2	.1	.2	.1	.2	.2	.1	.2	.1	.1	.1	.1	.2	.1	.1	.2
.4	.4	.3	.4	.4	.4	.3	.3	.3	.3	.4	.4	.4	.4	.3	.4	.5	.5	.5	.4	.4	.4	.4	.3	.4	.3	.4	.4	.4	.4	.4	.3	.3	.3	.3	.3
.6	.5	.6	.6	.5	.7	.6	.6	.7	.5	.7	.6	.5	.6	.5	.7	.6	.6	.7	.6	.7	.7	.6	.7	.6	.6	.7	.6	.7	.7	.6	.6	.4	.5	.5	.4
.8	.8	.8	.8	.7	.8	.8	.8	.8	.7	.8	.7	.7	.7	.7	.8	.7	.7	.7	.7	.8	.8	.8	.8	.8	.9	.9	.8	.9	.8	.8	.8	.7	.7	.7	.7
.8	.8	.9	.9	.8	.8	.8	.8	.9	.8	.8	.8	.8	.9	.8	.8	.8	.8	.8	.7	.8	.7	.7	.7	.7	.7	.7	.7	.7	.8	.9	.9	.8	.8	.8	.8
1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	.9	.9	.9	.8	.8	.7	.7	.7	.8	.8	.9	1.0	1.1	1.1	1.1	1.1	1.0	1.0

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

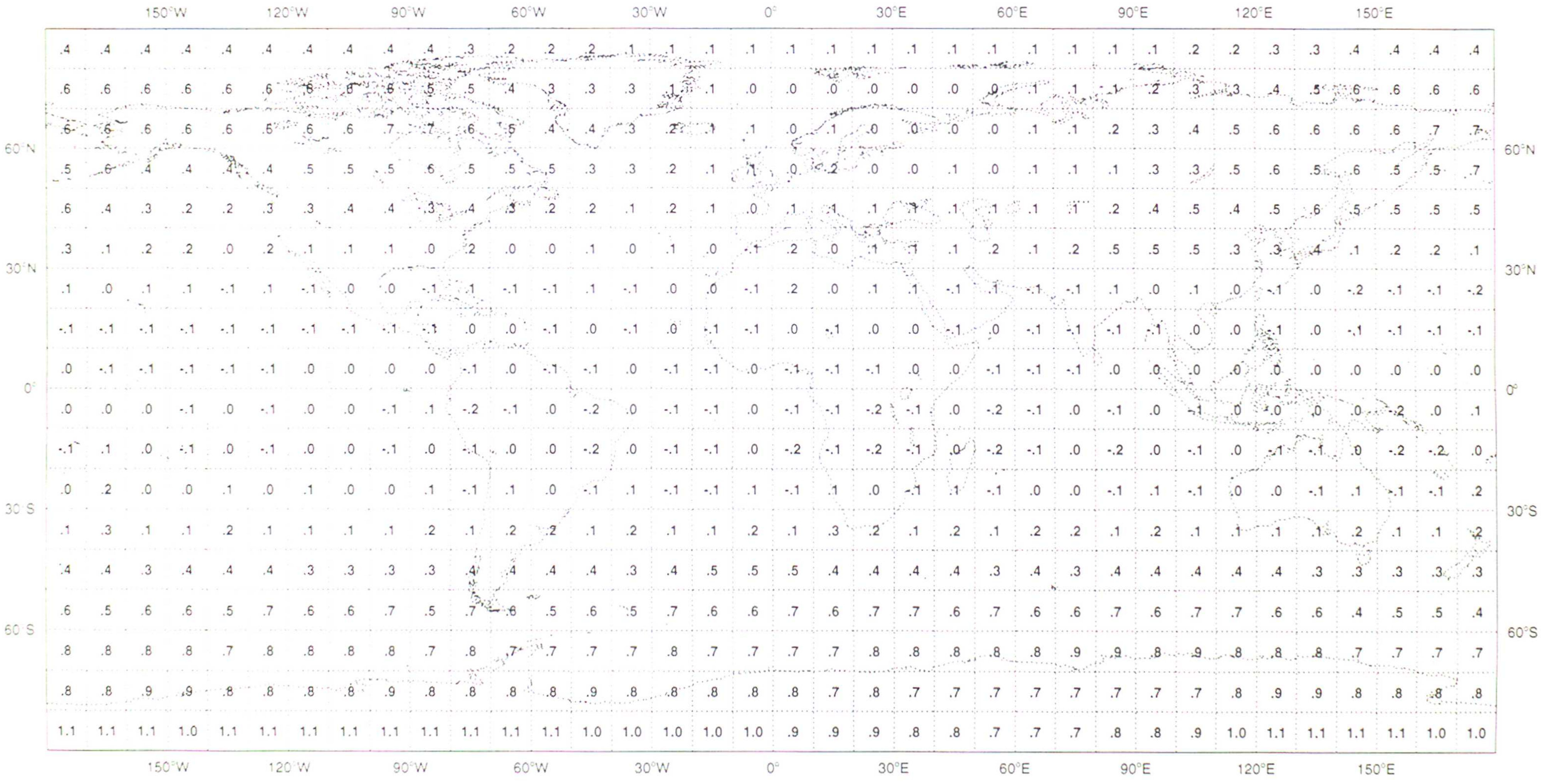

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

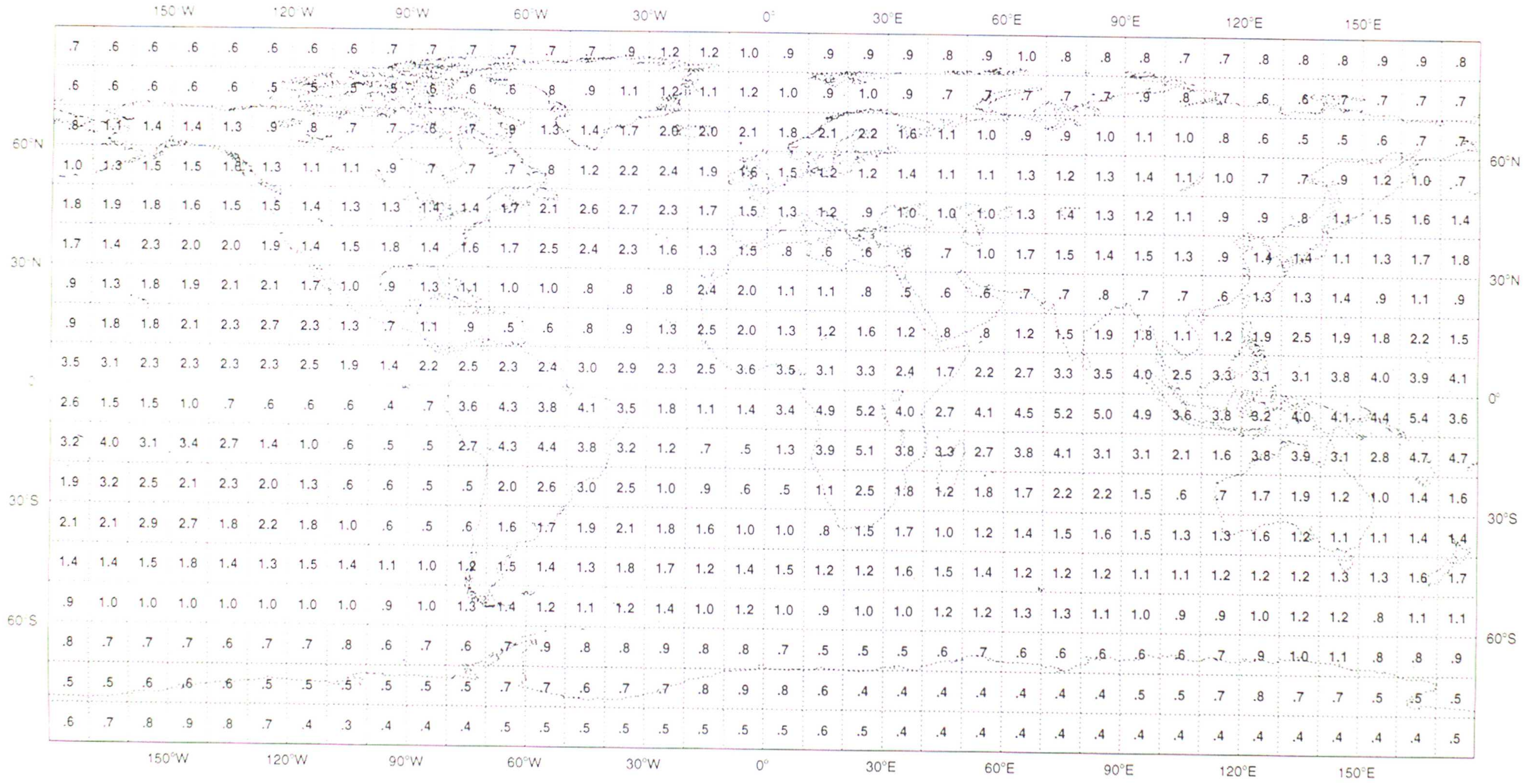
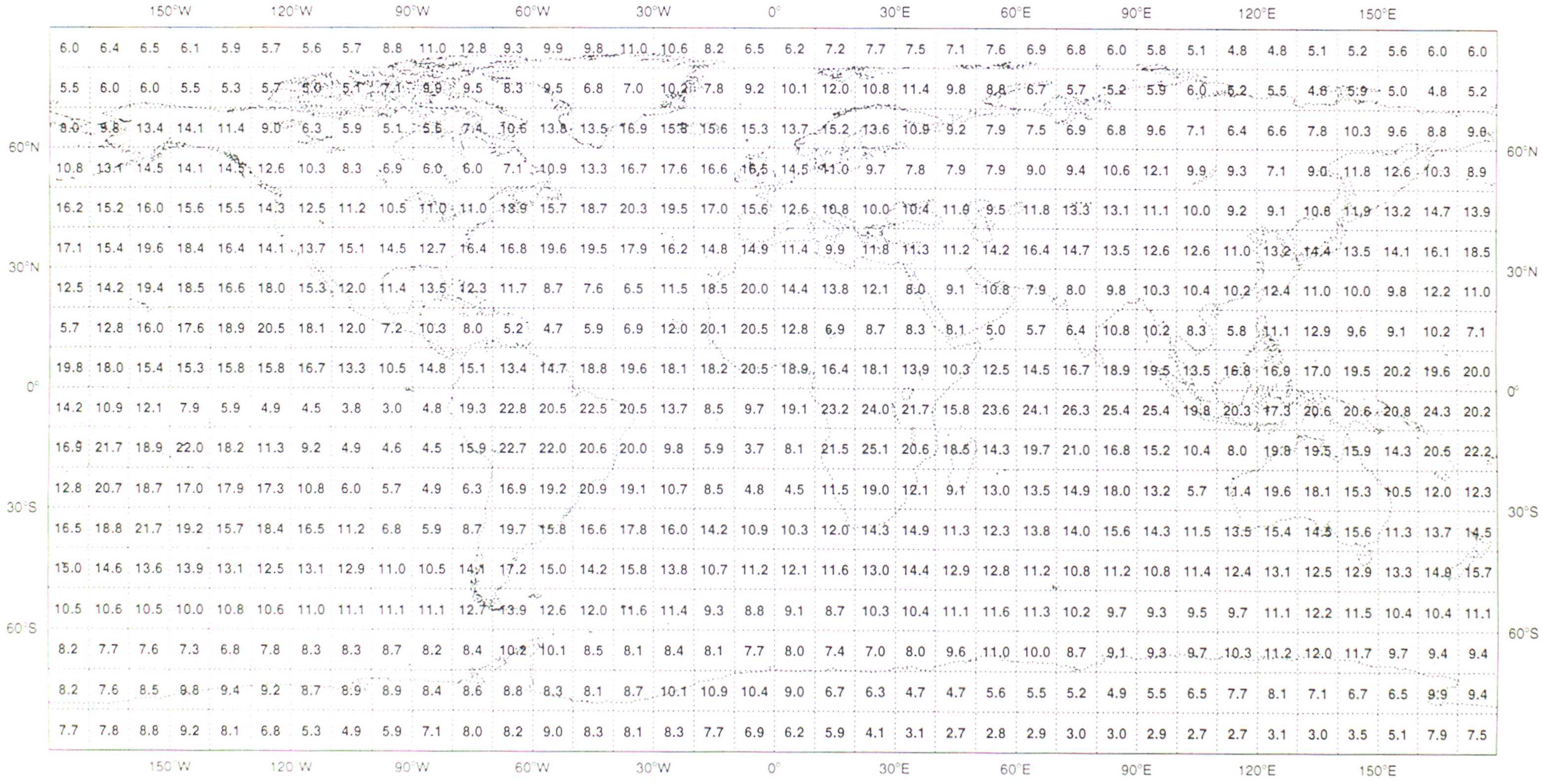
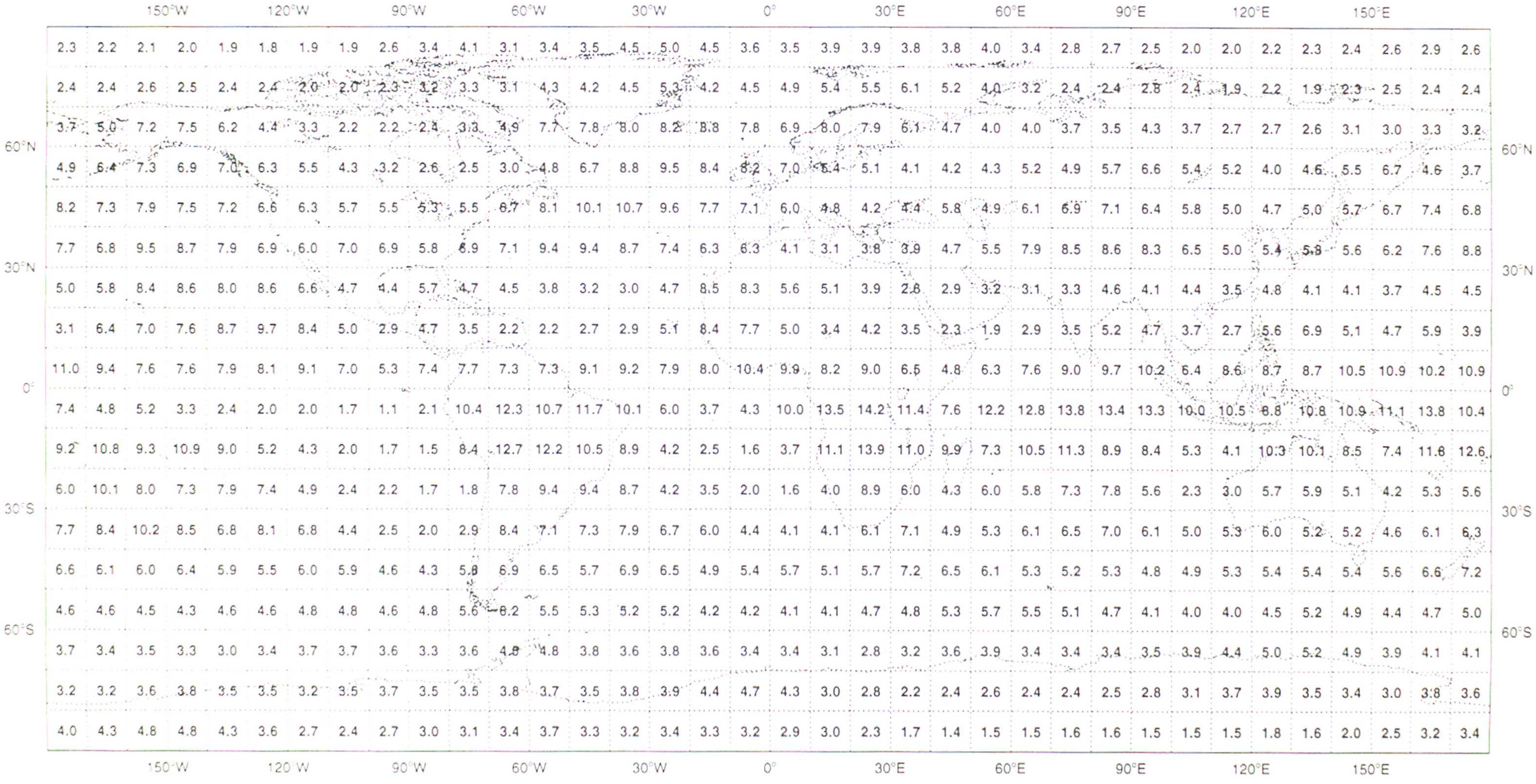

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.7 .6 .6 .6 .6 .6 .6 .6 .7 .7 .7 .7 .7 .7 .9 1.2 1.2 1.0 .9 .9 .9 .9 .8 .9 1.0 .8 .8 .8 .7 .7 .8 .8 .8 .9 .9 .8
.6 .6 .6 .6 .6 .5 .5 .5 .5 .6 .6 .6 .8 .9 1.1 1.2 1.1 1.2 1.0 .9 1.0 .9 .7 .7 .7 .7 .7 .9 .8 .7 .6 .6 .7 .7 .7 .7
.8 1.1 1.4 1.4 1.3 .9 .8 .7 .7 .6 .7 .9 1.3 1.4 1.7 2.0 2.0 2.1 1.8 2.1 2.2 1.6 1.1 1.0 .9 .9 1.0 1.1 1.0 .8 .6 .5 .5 .6 .7 .7
1.0 1.3 1.5 1.5 1.8 1.3 1.1 1.1 .9 .7 .7 .7 .8 1.2 2.2 2.4 1.9 1.6 1.5 1.2 1.2 1.4 1.1 1.1 1.3 1.2 1.3 1.4 1.1 1.0 .7 .7 .9 1.2 1.0 .7
1.8 1.9 1.8 1.6 1.5 1.5 1.4 1.3 1.3 1.4 1.4 1.7 2.1 2.6 2.7 2.3 1.7 1.5 1.3 1.2 .9 1.0 1.0 1.0 1.3 1.4 1.3 1.2 1.1 .9 .9 .8 1.1 1.5 1.6 1.4
1.7 1.4 2.3 2.0 2.0 1.9 1.4 1.5 1.8 1.4 1.6 1.7 2.5 2.4 2.3 1.6 1.3 1.5 .8 .6 .6 .6 .7 1.0 1.7 1.5 1.4 1.5 1.3 .9 1.4 1.4 1.1 1.3 1.7 1.8
.9 1.3 1.8 1.9 2.1 2.1 1.7 1.0 .9 1.3 1.1 1.0 1.0 .8 .8 .8 2.4 2.0 1.1 1.1 .8 .5 .6 .6 .7 .7 .8 .7 .7 .6 1.3 1.3 1.4 .9 1.1 .9
.9 1.8 1.8 2.1 2.3 2.7 2.3 1.3 .7 1.1 .9 .5 .6 .8 .9 1.3 2.5 2.0 1.3 1.2 1.6 1.2 .8 .8 1.2 1.5 1.9 1.8 1.1 1.2 1.9 2.5 1.9 1.8 2.2 1.5
3.5 3.1 2.3 2.3 2.3 2.3 2.5 1.9 1.4 2.2 2.5 2.3 2.4 3.0 2.9 2.3 2.5 3.6 3.5 3.1 3.3 2.4 1.7 2.2 2.7 3.3 3.5 4.0 2.5 3.3 3.1 3.1 3.8 4.0 3.9 4.1
2.6 1.5 1.5 1.0 .7 .6 .6 .6 .4 .7 3.6 4.3 3.8 4.1 3.5 1.8 1.1 1.4 3.4 4.9 5.2 4.0 2.7 4.1 4.5 5.2 5.0 4.9 3.6 3.8 3.2 4.0 4.1 4.4 5.4 3.6
3.2 4.0 3.1 3.4 2.7 1.4 1.0 .6 .5 .5 2.7 4.3 4.4 3.8 3.2 1.2 .7 .5 1.3 3.9 5.1 3.8 3.3 2.7 3.8 4.1 3.1 3.1 2.1 1.6 3.8 3.9 3.1 2.8 4.7 4.7
1.9 3.2 2.5 2.1 2.3 2.0 1.3 .6 .6 .5 .5 2.0 2.6 3.0 2.5 1.0 .9 .6 .5 1.1 2.5 1.8 1.2 1.8 1.7 2.2 2.2 1.5 .6 .7 1.7 1.9 1.2 1.0 1.4 1.6
2.1 2.1 2.9 2.7 1.8 2.2 1.8 1.0 .6 .5 .6 1.6 1.7 1.9 2.1 1.8 1.6 1.0 1.0 .8 1.5 1.7 1.0 1.2 1.4 1.5 1.6 1.5 1.3 1.3 1.6 1.2 1.1 1.1 1.4 1.4
1.4 1.4 1.5 1.8 1.4 1.3 1.5 1.4 1.1 1.0 1.2 1.5 1.4 1.3 1.8 1.7 1.2 1.4 1.5 1.2 1.2 1.6 1.5 1.4 1.2 1.2 1.2 1.1 1.1 1.2 1.2 1.2 1.3 1.3 1.6 1.7
.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 .9 1.0 1.3 1.4 1.2 1.1 1.2 1.4 1.0 1.2 1.0 .9 1.0 1.0 1.2 1.2 1.3 1.3 1.1 1.0 .9 .9 1.0 1.2 1.2 .8 1.1 1.1
.8 .7 .7 .7 .6 .7 .7 .8 .6 .7 .6 .7 .9 .8 .8 .9 .8 .8 .7 .5 .5 .5 .6 .7 .6 .6 .6 .6 .6 .7 .9 1.0 1.1 .8 .8 .9
.5 .5 .6 .6 .6 .5 .5 .5 .5 .5 .5 .7 .7 .6 .7 .7 .8 .9 .8 .6 .4 .4 .4 .4 .4 .4 .4 .5 .5 .7 .8 .7 .7 .5 .5 .5
.6 .7 .8 .9 .8 .7 .4 .3 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .6 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



6.0	6.4	6.5	6.1	5.9	5.7	5.6	5.7	8.8	11.0	12.8	9.3	9.9	9.8	11.0	10.6	8.2	6.5	6.2	7.2	7.7	7.5	7.1	7.6	6.9	6.8	6.0	5.8	5.1	4.8	4.8	5.1	5.2	5.6	6.0	6.0
5.5	6.0	6.0	5.5	5.3	5.7	5.0	5.1	7.1	9.9	9.5	8.3	9.5	6.8	7.0	10.2	7.8	9.2	10.1	12.0	10.8	11.4	9.8	8.8	6.7	5.7	5.2	5.9	6.0	5.2	5.5	4.8	5.9	5.0	4.8	5.2
8.0	9.8	13.4	14.1	11.4	9.0	6.3	5.9	5.1	5.6	7.4	10.6	13.8	13.5	16.9	15.8	15.6	15.3	13.7	15.2	13.6	10.9	9.2	7.9	7.5	6.9	6.8	9.6	7.1	6.4	6.6	7.8	10.3	9.6	8.8	9.8
10.8	13.1	14.5	14.1	14.5	12.6	10.3	8.3	6.9	6.0	6.0	7.1	10.9	13.3	16.7	17.6	16.6	16.5	14.5	11.0	9.7	7.8	7.9	7.9	9.0	9.4	10.6	12.1	9.9	9.3	7.1	9.0	11.8	12.6	10.3	8.9
16.2	15.2	16.0	15.6	15.5	14.3	12.5	11.2	10.5	11.0	11.0	13.9	15.7	18.7	20.3	19.5	17.0	15.6	12.6	10.8	10.0	10.4	11.9	9.5	11.8	13.3	13.1	11.1	10.0	9.2	9.1	10.8	11.9	13.2	14.7	13.9
17.1	15.4	19.6	18.4	16.4	14.1	13.7	15.1	14.5	12.7	16.4	16.8	19.6	19.5	17.9	16.2	14.8	14.9	11.4	9.9	11.8	11.3	11.2	14.2	16.4	14.7	13.5	12.6	12.6	11.0	13.2	14.4	13.5	14.1	16.1	18.5
12.5	14.2	19.4	18.5	16.6	18.0	15.3	12.0	11.4	13.5	12.3	11.7	8.7	7.6	6.5	11.5	18.5	20.0	14.4	13.8	12.1	8.0	9.1	10.8	7.9	8.0	9.8	10.3	10.4	10.2	12.4	11.0	10.0	9.8	12.2	11.0
5.7	12.8	16.0	17.6	18.9	20.5	18.1	12.0	7.2	10.3	8.0	5.2	4.7	5.9	6.9	12.0	20.1	20.5	12.8	6.9	8.7	8.3	8.1	5.0	5.7	6.4	10.8	10.2	8.3	5.8	11.1	12.9	9.6	9.1	10.2	7.1
19.8	18.0	15.4	15.3	15.8	15.8	16.7	13.3	10.5	14.8	15.1	13.4	14.7	18.8	19.6	18.1	18.2	20.5	18.9	16.4	18.1	13.9	10.3	12.5	14.5	16.7	18.9	19.5	13.5	16.8	16.9	17.0	19.5	20.2	19.6	20.0
14.2	10.9	12.1	7.9	5.9	4.9	4.5	3.8	3.0	4.8	19.3	22.8	20.5	22.5	20.5	13.7	8.5	9.7	19.1	23.2	24.0	21.7	15.8	23.6	24.1	26.3	25.4	25.4	19.8	20.3	17.3	20.6	20.6	20.8	24.3	20.2
16.9	21.7	18.9	22.0	18.2	11.3	9.2	4.9	4.6	4.5	15.9	22.7	22.0	20.6	20.0	9.8	5.9	3.7	8.1	21.5	25.1	20.6	18.5	14.3	19.7	21.0	16.8	15.2	10.4	8.0	19.8	19.5	15.9	14.3	20.5	22.2
12.8	20.7	18.7	17.0	17.9	17.3	10.8	6.0	5.7	4.9	6.3	16.9	19.2	20.9	19.1	10.7	8.5	4.8	4.5	11.5	19.0	12.1	9.1	13.0	13.5	14.9	18.0	13.2	5.7	11.4	19.6	18.1	15.3	10.5	12.0	12.3
16.5	18.8	21.7	19.2	15.7	18.4	16.5	11.2	6.8	5.9	8.7	19.7	15.8	16.6	17.8	16.0	14.2	10.9	10.3	12.0	14.3	14.9	11.3	12.3	13.8	14.0	15.6	14.3	11.5	13.5	15.4	14.5	15.6	11.3	13.7	14.5
15.0	14.6	13.6	13.9	13.1	12.5	13.1	12.9	11.0	10.5	14.1	17.2	15.0	14.2	15.8	13.8	10.7	11.2	12.1	11.6	13.0	14.4	12.9	12.8	11.2	10.8	11.2	10.8	11.4	12.4	13.1	12.5	12.9	13.3	14.9	15.7
10.5	10.6	10.5	10.0	10.8	10.6	11.0	11.1	11.1	11.1	12.7	13.9	12.6	12.0	11.6	11.4	9.3	8.8	9.1	8.7	10.3	10.4	11.1	11.6	11.3	10.2	9.7	9.3	9.5	9.7	11.1	12.2	11.5	10.4	10.4	11.1
8.2	7.7	7.6	7.3	6.8	7.8	8.3	8.3	8.7	8.2	8.4	10.2	10.1	8.5	8.1	8.4	8.1	7.7	8.0	7.4	7.0	8.0	9.6	11.0	10.0	8.7	9.1	9.3	9.7	10.3	11.2	12.0	11.7	9.7	9.4	9.4
8.2	7.6	8.5	9.8	9.4	9.2	8.7	8.9	8.9	8.4	8.6	8.8	8.3	8.1	8.7	10.1	10.9	10.4	9.0	6.7	6.3	4.7	4.7	5.6	5.5	5.2	4.9	5.5	6.5	7.7	8.1	7.1	6.7	6.5	9.9	9.4
7.7	7.8	8.8	9.2	8.1	6.8	5.3	4.9	5.9	7.1	8.0	8.2	9.0	8.3	8.1	8.3	7.7	6.9	6.2	5.9	4.1	3.1	2.7	2.8	2.9	3.0	3.0	2.9	2.7	2.7	3.1	3.0	3.5	5.1	7.9	7.5

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations

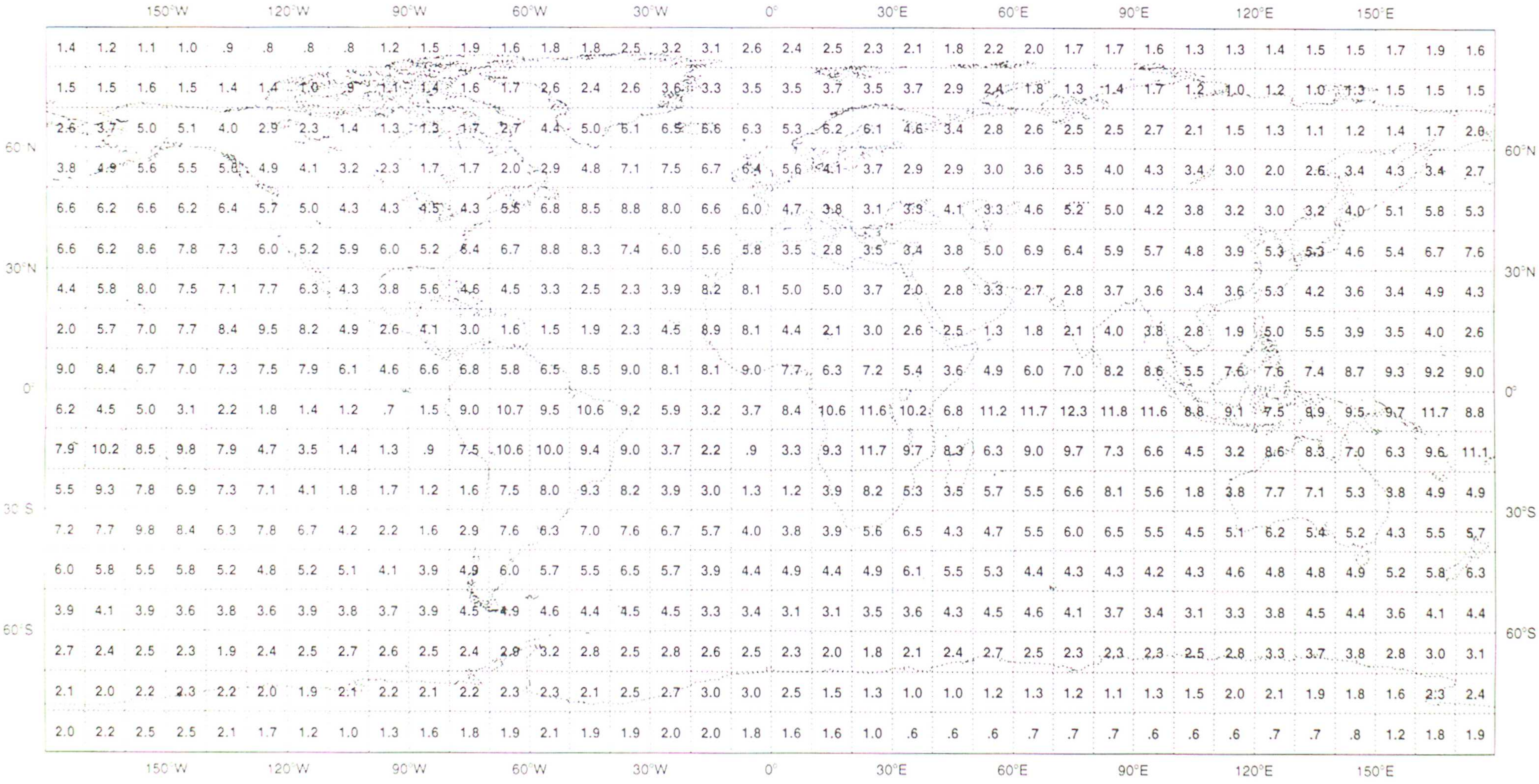


2.3	2.2	2.1	2.0	1.9	1.8	1.9	1.9	2.6	3.4	4.1	3.1	3.4	3.5	4.5	5.0	4.5	3.6	3.5	3.9	3.9	3.8	3.8	4.0	3.4	2.8	2.7	2.5	2.0	2.0	2.2	2.3	2.4	2.6	2.9	2.6
2.4	2.4	2.6	2.5	2.4	2.4	2.0	2.0	2.3	3.2	3.3	3.1	4.3	4.2	4.5	5.3	4.2	4.5	4.9	5.4	5.5	6.1	5.2	4.0	3.2	2.4	2.4	2.8	2.4	1.9	2.2	1.9	2.3	2.5	2.4	2.4
3.7	5.0	7.2	7.5	6.2	4.4	3.3	2.2	2.2	2.4	3.3	4.9	7.7	7.8	8.0	8.2	8.8	7.8	6.9	8.0	7.9	6.1	4.7	4.0	4.0	3.7	3.5	4.3	3.7	2.7	2.7	2.6	3.1	3.0	3.3	3.2
4.9	6.4	7.3	6.9	7.0	6.3	5.5	4.3	3.2	2.6	2.5	3.0	4.8	6.7	8.8	9.5	8.4	8.2	7.0	5.4	5.1	4.1	4.2	4.3	5.2	4.9	5.7	6.6	5.4	5.2	4.0	4.6	5.5	6.7	4.6	3.7
8.2	7.3	7.9	7.5	7.2	6.6	6.3	5.7	5.5	5.3	5.5	6.7	8.1	10.1	10.7	9.6	7.7	7.1	6.0	4.8	4.2	4.4	5.8	4.9	6.1	6.9	7.1	6.4	5.8	5.0	4.7	5.0	5.7	6.7	7.4	6.8
7.7	6.8	9.5	8.7	7.9	6.9	6.0	7.0	6.9	5.8	6.9	7.1	9.4	9.4	8.7	7.4	6.3	6.3	4.1	3.1	3.8	3.9	4.7	5.5	7.9	8.5	8.6	8.3	6.5	5.0	5.4	5.8	5.6	6.2	7.6	8.8
5.0	5.8	8.4	8.6	8.0	8.6	6.6	4.7	4.4	5.7	4.7	4.5	3.8	3.2	3.0	4.7	8.5	8.3	5.6	5.1	3.9	2.8	2.9	3.2	3.1	3.3	4.6	4.1	4.4	3.5	4.8	4.1	4.1	3.7	4.5	4.5
3.1	6.4	7.0	7.6	8.7	9.7	8.4	5.0	2.9	4.7	3.5	2.2	2.2	2.7	2.9	5.1	8.4	7.7	5.0	3.4	4.2	3.5	2.3	1.9	2.9	3.5	5.2	4.7	3.7	2.7	5.6	6.9	5.1	4.7	5.9	3.9
11.0	9.4	7.6	7.6	7.9	8.1	9.1	7.0	5.3	7.4	7.7	7.3	7.3	9.1	9.2	7.9	8.0	10.4	9.9	8.2	9.0	6.5	4.8	6.3	7.6	9.0	9.7	10.2	6.4	8.6	8.7	8.7	10.5	10.9	10.2	10.9
7.4	4.8	5.2	3.3	2.4	2.0	2.0	1.7	1.1	2.1	10.4	12.3	10.7	11.7	10.1	6.0	3.7	4.3	10.0	13.5	14.2	11.4	7.6	12.2	12.8	13.8	13.4	13.3	10.0	10.5	8.8	10.8	10.9	11.1	13.8	10.4
9.2	10.8	9.3	10.9	9.0	5.2	4.3	2.0	1.7	1.5	8.4	12.7	12.2	10.5	8.9	4.2	2.5	1.6	3.7	11.1	13.9	11.0	9.9	7.3	10.5	11.3	8.9	8.4	5.3	4.1	10.3	10.1	8.5	7.4	11.8	12.6
6.0	10.1	8.0	7.3	7.9	7.4	4.9	2.4	2.2	1.7	1.8	7.8	9.4	9.4	8.7	4.2	3.5	2.0	1.6	4.0	8.9	6.0	4.3	6.0	5.8	7.3	7.8	5.6	2.3	3.0	5.7	5.9	5.1	4.2	5.3	5.6
7.7	8.4	10.2	8.5	6.8	8.1	6.8	4.4	2.5	2.0	2.9	8.4	7.1	7.3	7.9	6.7	6.0	4.4	4.1	4.1	6.1	7.1	4.9	5.3	6.1	6.5	7.0	6.1	5.0	5.3	6.0	5.2	5.2	4.6	6.1	6.3
6.6	6.1	6.0	6.4	5.9	5.5	6.0	5.9	4.6	4.3	5.8	6.9	6.5	5.7	6.9	6.5	4.9	5.4	5.7	5.1	5.7	7.2	6.5	6.1	5.3	5.2	5.3	4.8	4.9	5.3	5.4	5.4	5.4	5.6	6.6	7.2
4.6	4.6	4.5	4.3	4.6	4.6	4.8	4.8	4.6	4.8	5.6	8.2	5.5	5.3	5.2	5.2	4.2	4.2	4.1	4.1	4.7	4.8	5.3	5.7	5.5	5.1	4.7	4.1	4.0	4.0	4.5	5.2	4.9	4.4	4.7	5.0
3.7	3.4	3.5	3.3	3.0	3.4	3.7	3.7	3.6	3.3	3.6	4.8	4.8	3.8	3.6	3.8	3.6	3.4	3.4	3.1	2.8	3.2	3.6	3.9	3.4	3.4	3.4	3.5	3.9	4.4	5.0	5.2	4.9	3.9	4.1	4.1
3.2	3.2	3.6	3.8	3.5	3.5	3.2	3.5	3.7	3.5	3.5	3.8	3.7	3.5	3.8	3.9	4.4	4.7	4.3	3.0	2.8	2.2	2.4	2.6	2.4	2.4	2.5	2.8	3.1	3.7	3.9	3.5	3.4	3.0	3.8	3.6
4.0	4.3	4.8	4.8	4.3	3.6	2.7	2.4	2.7	3.0	3.1	3.4	3.7	3.3	3.2	3.4	3.3	3.2	2.9	3.0	2.3	1.7	1.4	1.5	1.5	1.6	1.6	1.5	1.5	1.5	1.8	1.6	2.0	2.5	3.2	3.4

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002

Channel: AMSUA-7 (300 hPa)

NOAA16, using all observations



1.4	1.2	1.1	1.0	.9	.8	.8	.8	1.2	1.5	1.9	1.6	1.8	1.8	2.5	3.2	3.1	2.6	2.4	2.5	2.3	2.1	1.8	2.2	2.0	1.7	1.7	1.6	1.3	1.3	1.4	1.5	1.5	1.7	1.9	1.6
1.5	1.5	1.6	1.5	1.4	1.4	1.0	.9	1.1	1.4	1.6	1.7	2.6	2.4	2.6	3.6	3.3	3.5	3.5	3.7	3.5	3.7	2.9	2.4	1.8	1.3	1.4	1.7	1.2	1.0	1.2	1.0	1.3	1.5	1.5	1.5
2.6	3.7	5.0	5.1	4.0	2.9	2.3	1.4	1.3	1.3	1.7	2.7	4.4	5.0	6.1	6.5	5.6	6.3	5.3	6.2	6.1	4.6	3.4	2.8	2.6	2.5	2.5	2.7	2.1	1.5	1.3	1.1	1.2	1.4	1.7	2.8
3.8	4.9	5.6	5.5	5.8	4.9	4.1	3.2	2.3	1.7	1.7	2.0	2.9	4.8	7.1	7.5	6.7	6.4	5.6	4.1	3.7	2.9	2.9	3.0	3.6	3.5	4.0	4.3	3.4	3.0	2.0	2.6	3.4	4.3	3.4	2.7
6.6	6.2	6.6	6.2	6.4	5.7	5.0	4.3	4.3	4.5	4.3	5.5	6.8	8.5	8.8	8.0	6.6	6.0	4.7	3.8	3.1	3.3	4.1	3.3	4.6	5.2	5.0	4.2	3.8	3.2	3.0	3.2	4.0	5.1	5.8	5.3
6.6	6.2	8.6	7.8	7.3	6.0	5.2	5.9	6.0	5.2	6.4	6.7	8.8	8.3	7.4	6.0	5.6	5.8	3.5	2.8	3.5	3.4	3.8	5.0	6.9	6.4	5.9	5.7	4.8	3.9	5.3	5.3	4.6	5.4	6.7	7.6
4.4	5.8	8.0	7.5	7.1	7.7	6.3	4.3	3.8	5.6	4.6	4.5	3.3	2.5	2.3	3.9	8.2	8.1	5.0	5.0	3.7	2.0	2.8	3.3	2.7	2.8	3.7	3.6	3.4	3.6	5.3	4.2	3.6	3.4	4.9	4.3
2.0	5.7	7.0	7.7	8.4	9.5	8.2	4.9	2.6	4.1	3.0	1.6	1.5	1.9	2.3	4.5	8.9	8.1	4.4	2.1	3.0	2.6	2.5	1.3	1.8	2.1	4.0	3.8	2.8	1.9	5.0	5.5	3.9	3.5	4.0	2.6
9.0	8.4	6.7	7.0	7.3	7.5	7.9	6.1	4.6	6.6	6.8	5.8	6.5	8.5	9.0	8.1	8.1	9.0	7.7	6.3	7.2	5.4	3.6	4.9	6.0	7.0	8.2	8.6	5.5	7.6	7.6	7.4	8.7	9.3	9.2	9.0
6.2	4.5	5.0	3.1	2.2	1.8	1.4	1.2	.7	1.5	9.0	10.7	9.5	10.6	9.2	5.9	3.2	3.7	8.4	10.6	11.6	10.2	6.8	11.2	11.7	12.3	11.8	11.6	8.8	9.1	7.5	9.9	9.5	9.7	11.7	8.8
7.9	10.2	8.5	9.8	7.9	4.7	3.5	1.4	1.3	.9	7.5	10.6	10.0	9.4	9.0	3.7	2.2	.9	3.3	9.3	11.7	9.7	8.3	6.3	9.0	9.7	7.3	6.6	4.5	3.2	8.6	8.3	7.0	6.3	9.6	11.1
5.5	9.3	7.8	6.9	7.3	7.1	4.1	1.8	1.7	1.2	1.6	7.5	8.0	9.3	8.2	3.9	3.0	1.3	1.2	3.9	8.2	5.3	3.5	5.7	5.5	6.6	8.1	5.6	1.8	3.8	7.7	7.1	5.3	3.8	4.9	4.9
7.2	7.7	9.8	8.4	6.3	7.8	6.7	4.2	2.2	1.6	2.9	7.6	6.3	7.0	7.6	6.7	5.7	4.0	3.8	3.9	5.6	6.5	4.3	4.7	5.5	6.0	6.5	5.5	4.5	5.1	6.2	5.4	5.2	4.3	5.5	5.7
6.0	5.8	5.5	5.8	5.2	4.8	5.2	5.1	4.1	3.9	4.9	6.0	5.7	5.5	6.5	5.7	3.9	4.4	4.9	4.4	4.9	6.1	5.5	5.3	4.4	4.3	4.3	4.2	4.3	4.6	4.8	4.8	4.9	5.2	5.8	6.3
3.9	4.1	3.9	3.6	3.8	3.6	3.9	3.8	3.7	3.9	4.5	4.9	4.6	4.4	4.5	4.5	3.3	3.4	3.1	3.1	3.5	3.6	4.3	4.5	4.6	4.1	3.7	3.4	3.1	3.3	3.8	4.5	4.4	3.6	4.1	4.4
2.7	2.4	2.5	2.3	1.9	2.4	2.5	2.7	2.6	2.5	2.4	2.8	3.2	2.8	2.5	2.8	2.6	2.5	2.3	2.0	1.8	2.1	2.4	2.7	2.5	2.3	2.3	2.3	2.5	2.8	3.3	3.7	3.8	2.8	3.0	3.1
2.1	2.0	2.2	2.3	2.2	2.0	1.9	2.1	2.2	2.1	2.2	2.3	2.3	2.1	2.5	2.7	3.0	3.0	2.5	1.5	1.3	1.0	1.0	1.2	1.3	1.2	1.1	1.3	1.5	2.0	2.1	1.9	1.8	1.6	2.3	2.4
2.0	2.2	2.5	2.5	2.1	1.7	1.2	1.0	1.3	1.6	1.8	1.9	2.1	1.9	1.9	2.0	2.0	1.8	1.6	1.6	1.0	.6	.6	.6	.7	.7	.7	.6	.6	.6	.7	.7	.8	1.2	1.8	1.9

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations

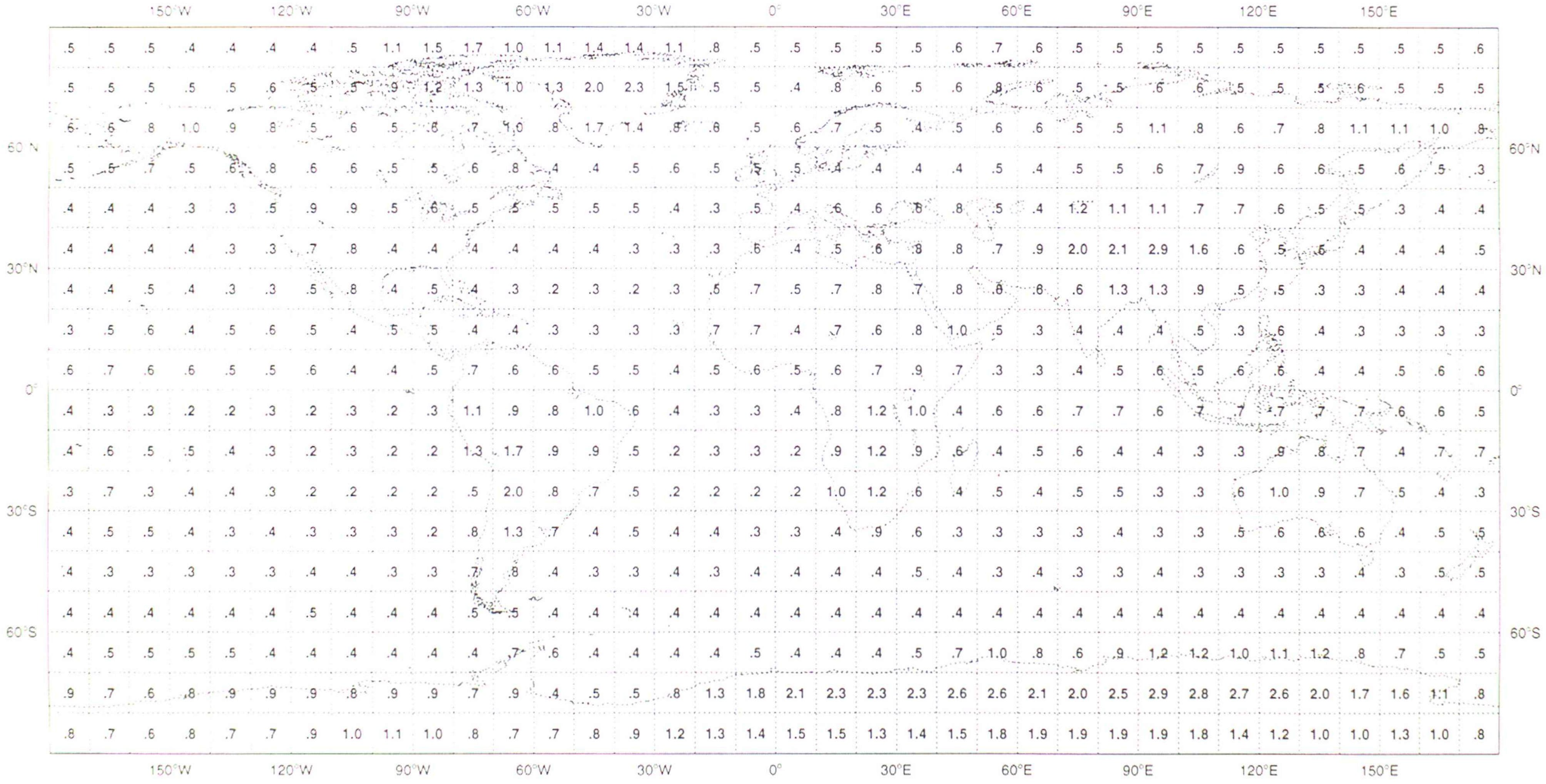
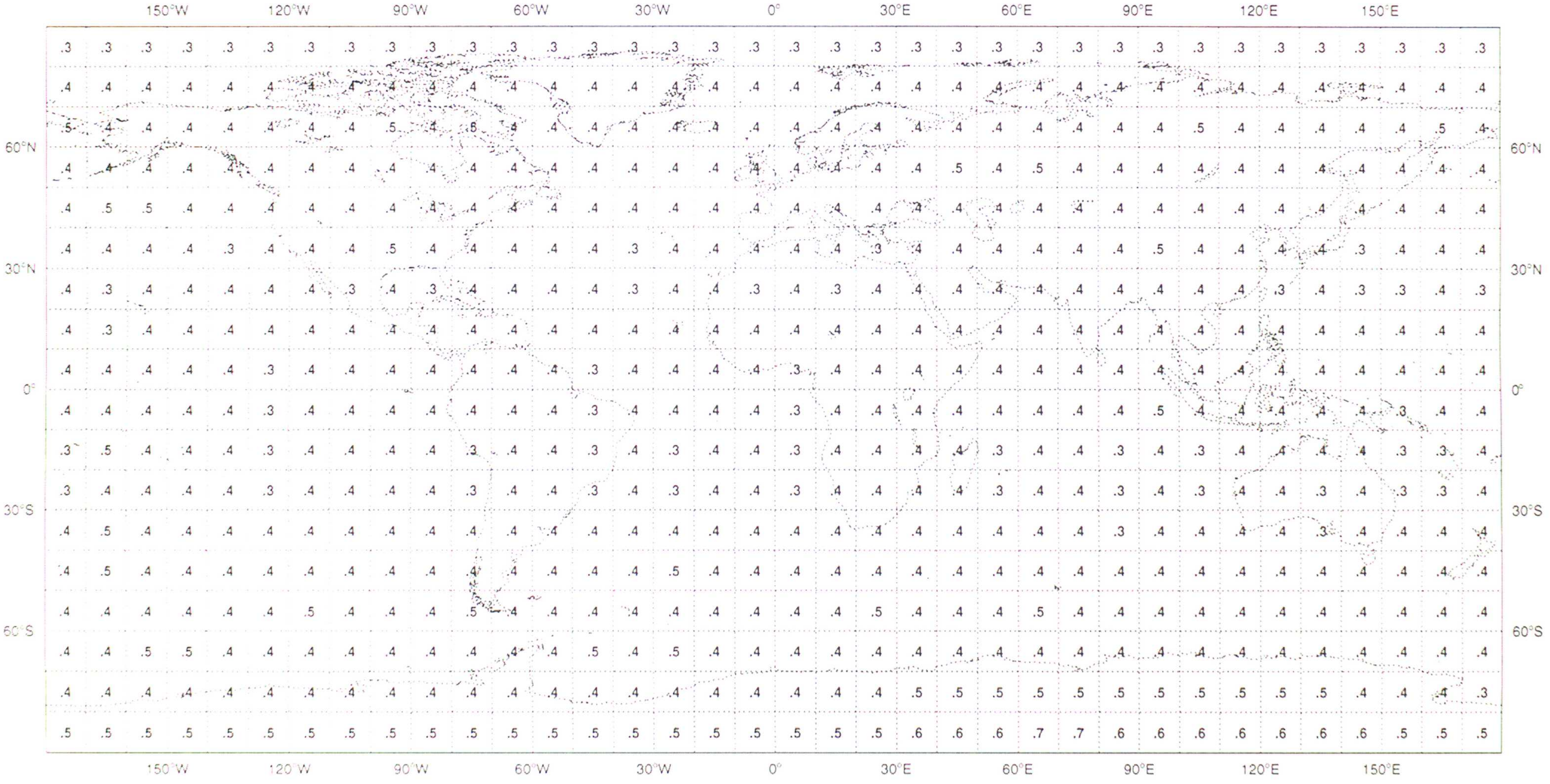

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.5 .5 .5 .4 .4 .4 .4 .5 1.1 1.5 1.7 1.0 1.1 1.4 1.4 1.1 .8 .5 .5 .5 .5 .5 .6 .7 .6 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6
.5 .5 .5 .5 .5 .6 .5 .5 .9 1.2 1.3 1.0 1.3 2.0 2.3 1.5 .5 .5 .4 .8 .6 .5 .6 .8 .6 .5 .5 .6 .6 .5 .5 .5 .6 .5 .5 .5
.6 .6 .8 1.0 .9 .8 .5 .6 .5 .6 .7 1.0 .8 1.7 1.4 .8 .8 .5 .6 .7 .5 .4 .5 .6 .6 .5 .5 1.1 .8 .6 .7 .8 1.1 1.1 1.0 .8
.5 .5 .7 .5 .6 .8 .6 .6 .5 .5 .6 .8 .4 .4 .5 .6 .5 .5 .5 .4 .4 .4 .4 .5 .4 .5 .5 .6 .7 .9 .6 .6 .5 .6 .5 .3
.4 .4 .4 .3 .3 .5 .9 .9 .5 .6 .5 .5 .5 .5 .5 .4 .3 .5 .4 .6 .6 .8 .8 .5 .4 1.2 1.1 1.1 .7 .7 .6 .5 .5 .3 .4 .4
.4 .4 .4 .4 .3 .3 .7 .8 .4 .4 .4 .4 .4 .4 .3 .3 .3 .6 .4 .5 .6 .8 .8 .7 .9 2.0 2.1 2.9 1.6 .6 .5 .5 .4 .4 .4 .5
.4 .4 .5 .4 .3 .3 .5 .8 .4 .5 .4 .3 .2 .3 .2 .3 .5 .7 .5 .7 .8 .7 .8 .8 .6 .6 1.3 1.3 .9 .5 .5 .3 .3 .4 .4 .4
.3 .5 .6 .4 .5 .6 .5 .4 .5 .5 .4 .4 .3 .3 .3 .3 .7 .7 .4 .7 .6 .8 1.0 .5 .3 .4 .4 .4 .5 .3 .6 .4 .3 .3 .3 .3
.6 .7 .6 .6 .5 .5 .6 .4 .4 .5 .7 .6 .6 .5 .5 .4 .5 .6 .5 .6 .7 .9 .7 .3 .3 .4 .5 .6 .5 .6 .6 .4 .4 .5 .6 .6
.4 .3 .3 .2 .2 .3 .2 .3 .2 .3 1.1 .9 .8 1.0 .6 .4 .3 .3 .4 .8 1.2 1.0 .4 .6 .6 .7 .7 .6 .7 .7 .7 .7 .7 .6 .6 .5
.4 .6 .5 .5 .4 .3 .2 .3 .2 .2 1.3 1.7 .9 .9 .5 .2 .3 .3 .2 .9 1.2 .9 .6 .4 .5 .6 .4 .4 .3 .3 .9 .8 .7 .4 .7 .7
.3 .7 .3 .4 .4 .3 .2 .2 .2 .2 .5 2.0 .8 .7 .5 .2 .2 .2 .2 1.0 1.2 .6 .4 .5 .4 .5 .5 .3 .3 .6 1.0 .9 .7 .5 .4 .3
.4 .5 .5 .4 .3 .4 .3 .3 .3 .2 .8 1.3 .7 .4 .5 .4 .4 .3 .3 .4 .9 .6 .3 .3 .3 .3 .4 .3 .3 .5 .6 .6 .6 .4 .5 .5
.4 .3 .3 .3 .3 .3 .4 .4 .3 .3 .7 .8 .4 .3 .3 .4 .3 .4 .4 .4 .4 .5 .4 .3 .4 .3 .3 .4 .3 .3 .3 .3 .4 .3 .5 .5
.4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .5 .5 .5 .5 .4 .4 .4 .4 .4 .4 .7 .6 .4 .4 .4 .4 .5 .4 .4 .4 .5 .7 1.0 .8 .6 .9 1.2 1.2 1.0 1.1 1.2 .8 .7 .5 .5
.9 .7 .6 .8 .9 .9 .9 .8 .9 .9 .7 .9 .4 .5 .5 .8 1.3 1.8 2.1 2.3 2.3 2.3 2.6 2.6 2.1 2.0 2.5 2.9 2.8 2.7 2.6 2.0 1.7 1.6 1.1 .8
.8 .7 .6 .8 .7 .7 .9 1.0 1.1 1.0 .8 .7 .7 .8 .9 1.2 1.3 1.4 1.5 1.5 1.3 1.4 1.5 1.8 1.9 1.9 1.9 1.9 1.8 1.4 1.2 1.0 1.0 1.3 1.0 .8

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations


150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
.3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3 .3
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.5 .4 .4 .4 .4 .4 .4 .4 .5 .4 .6 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .5 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
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.4 .4 .4 .4 .3 .4 .4 .4 .5 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .3 .4 .4 .4
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.4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .4 .4 .4 .4 .3 .4 .4
.3 .5 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .4 .4 .4 .4 .3 .3 .4
.3 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .3 .4 .3 .4 .4 .3 .4 .3 .3 .4
.4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .3 .4 .4 .4 .4 .3 .4 .4 .4 .4
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.4 .4 .5 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .4 .5 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4
.4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .4 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .4 .4 .4 .3
.5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .5 .6 .6 .6 .7 .7 .6 .6 .6 .6 .6 .6 .6 .5 .5 .5

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). JANUARY 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

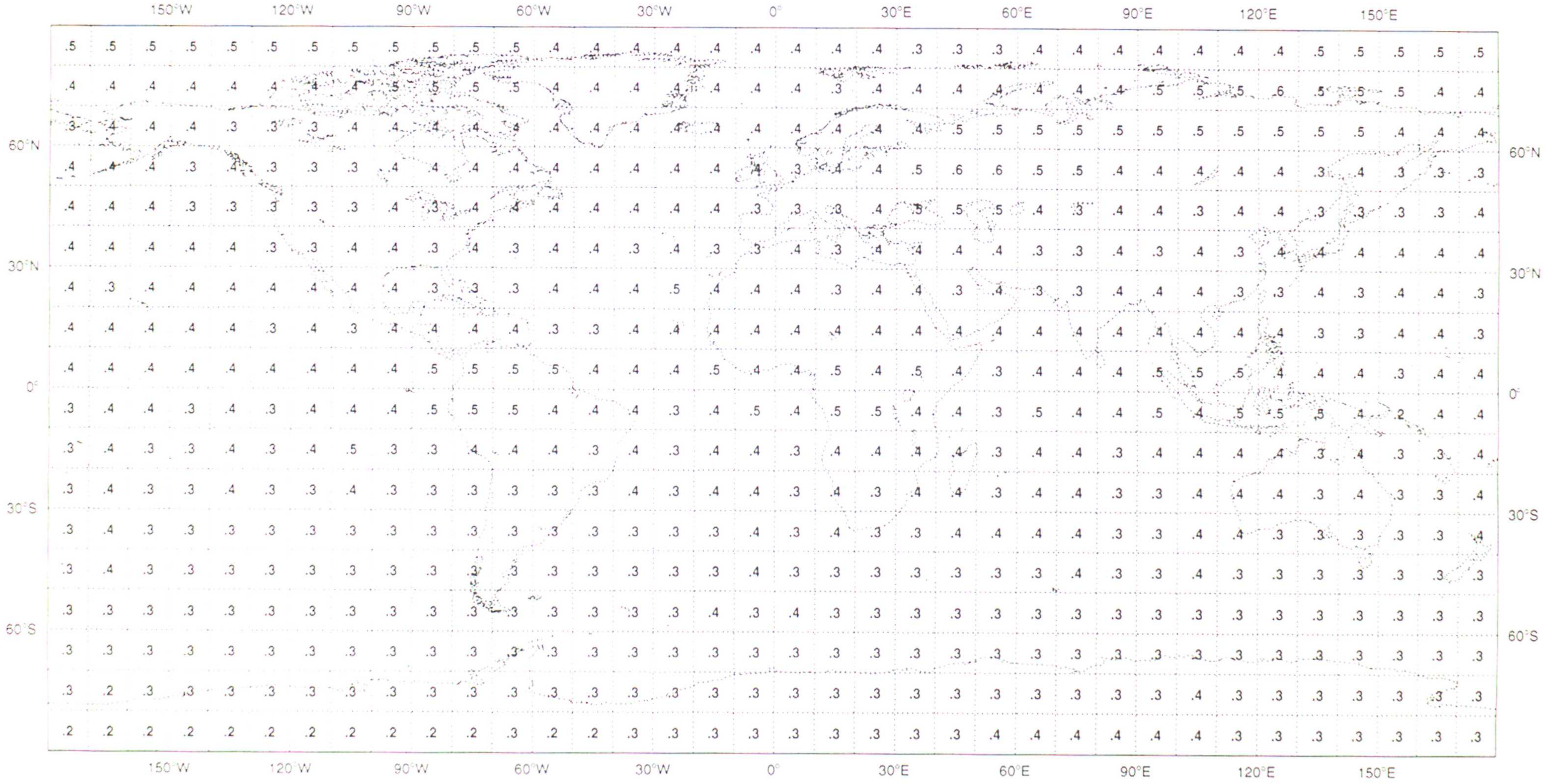
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored		
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. **N.B. A positive bias indicates the wind observation is veered to the background**
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
106018	19.5	-83.5	ALL	P	SUR	1	0	0	0.0	-2.1	2.1
24778	44.9	-23.3	ALL	P	SUR	1	0	0	0.0	-1.1	1.1
41523	30.5	-44.7	ALL	P	SUR	416	0	0	0.8	0.1	0.8
41552	20.1	-48.4	ALL	P	SUR	608	0	0	0.5	-1.1	1.3
41553	20.8	-66.7	ALL	P	SUR	642	0	0	0.5	-0.4	0.6
41554	22.1	-68.0	ALL	P	SUR	645	0	0	0.5	-0.7	0.8
41556	15.5	-64.8	ALL	P	SUR	619	0	0	0.5	-0.7	0.9
41557	19.9	-59.8	ALL	P	SUR	630	0	0	0.5	-0.5	0.7
41559	19.5	-59.1	ALL	P	SUR	613	0	0	0.5	-0.6	0.7
41560	16.9	-54.8	ALL	P	SUR	575	0	0	0.5	-0.5	0.7
41561	20.0	-53.7	ALL	P	SUR	606	0	0	0.5	-0.8	0.9
41563	16.9	-43.6	ALL	P	SUR	630	0	0	0.5	-0.6	0.8
41645	30.2	-78.0	ALL	P	SUR	814	0	0	0.6	0.4	0.7
41647	23.3	-72.7	ALL	P	SUR	633	0	0	0.5	-0.1	0.5
41648	26.8	-76.0	ALL	P	SUR	630	0	0	0.5	0.2	0.6
41650	23.5	-73.2	ALL	P	SUR	772	0	0	0.5	0.6	0.7
41651	24.3	-75.4	ALL	P	SUR	628	0	0	0.6	0.2	0.6
41652	27.2	-64.5	ALL	P	SUR	625	0	0	0.6	-0.2	0.6
41655	34.2	-75.8	ALL	P	SUR	201	0	0	1.1	-0.1	1.1
41656	32.2	-79.8	ALL	P	SUR	651	0	0	0.8	0.1	0.8
41657	40.6	-60.4	ALL	P	SUR	586	2	0	1.8	0.2	1.8
41658	41.8	-43.7	ALL	P	SUR	822	10	1	2.0	-0.4	2.1
41659	37.1	-58.5	ALL	P	SUR	685	0	0	1.3	1.0	1.7
44513	37.8	-73.9	ALL	P	SUR	306	34	11	5.0	-2.2	5.5
44514	37.5	-73.3	ALL	P	SUR	363	0	0	0.6	0.0	0.6
44515	38.0	-71.5	ALL	P	SUR	303	76	25	6.6	-3.6	7.5
44516	39.9	-71.1	ALL	P	SUR	320	106	33	5.4	-3.7	6.5
44517	41.0	-68.5	ALL	P	SUR	320	91	28	5.7	-4.4	7.2
44546	63.4	-9.5	ALL	P	SUR	1402	2	0	1.1	-0.8	1.3
44548	54.3	-11.7	ALL	P	SUR	695	1	0	1.0	-0.1	1.0
44549	52.8	-26.3	ALL	P	SUR	1203	6	0	1.6	0.6	1.7
44550	49.7	-32.6	ALL	P	SUR	1164	11	1	2.1	-0.1	2.1
44606	44.6	-34.6	ALL	P	SUR	2	0	0	0.4	-0.8	1.0
44612	28.3	-25.9	ALL	P	SUR	779	0	0	1.1	-0.5	1.2
44616	45.2	-32.8	ALL	P	SUR	1298	0	0	1.6	0.1	1.6
44621	60.9	-31.7	ALL	P	SUR	1439	0	0	1.1	0.2	1.2
44623	34.9	-21.5	ALL	P	SUR	1091	0	0	0.7	0.2	0.7
44624	43.9	-42.2	ALL	P	SUR	1177	0	0	1.2	0.3	1.2
44625	41.2	-46.3	ALL	P	SUR	849	0	0	1.3	0.0	1.3
44626	59.1	-32.3	ALL	P	SUR	1	0	0	0.0	-1.8	1.8
44627	44.9	-42.7	ALL	P	SUR	823	6	1	1.4	-0.5	1.5
44720	33.9	-29.9	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
44721	34.0	-30.4	ALL	P	SUR	940	0	0	1.1	0.3	1.1
44723	48.9	-45.9	ALL	P	SUR	1718	6	0	1.5	0.1	1.5
44726	58.7	-38.1	ALL	P	SUR	1522	10	1	2.0	0.4	2.0
44728	52.6	-44.0	ALL	P	SUR	1277	1	0	2.1	-0.1	2.1
44729	38.2	-19.3	ALL	P	SUR	933	1	0	3.2	-0.9	3.4
44730	52.0	-34.6	ALL	P	SUR	1468	13	1	2.1	-0.1	2.1
44742	55.3	-33.2	ALL	P	SUR	1316	5	0	1.5	0.0	1.5
44743	59.5	-36.1	ALL	P	SUR	779	3	0	1.6	-0.5	1.7
44746	59.3	-36.1	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
44760	53.1	-43.2	ALL	P	SUR	103	1	1	1.2	-0.8	1.5
44763	45.9	-46.7	ALL	P	SUR	561	5	1	2.0	0.2	2.0
44765	30.4	-29.5	ALL	P	SUR	91	2	2	3.7	2.9	4.7
44771	59.9	-8.3	ALL	P	SUR	986	0	0	1.3	0.3	1.3
44775	29.5	-33.7	ALL	P	SUR	796	0	0	0.6	-0.5	0.8
44776	59.7	-4.3	ALL	P	SUR	1514	1	0	0.8	-0.3	0.8
44778	45.6	-22.4	ALL	P	SUR	1086	0	0	1.3	-0.2	1.3
44779	54.9	-43.0	ALL	P	SUR	37	0	0	1.3	-2.3	2.6
44786	60.2	-7.6	ALL	P	SUR	1	0	0	0.0	2.1	2.1

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE											
44805	43.2	-69.4	ALL	P	SUR	2	0	0	0.3	-0.8	0.9
44826	58.6	-38.2	ALL	P	SUR	1	0	0	0.0	6.8	6.8
44829	38.4	-19.1	ALL	P	SUR	1	0	0	0.0	0.7	0.7
44840	43.7	-51.7	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
44871	60.5	-8.2	ALL	P	SUR	1	0	0	0.0	0.2	0.2
46546	63.9	-7.6	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
47555	44.8	-63.5	ALL	P	SUR	2	0	0	0.9	-6.4	6.5
47556	68.4	-65.0	ALL	P	SUR	512	0	0	1.0	0.3	1.0
47596	68.5	-65.2	ALL	P	SUR	1	0	0	0.0	0.3	0.3
48527	44.8	-63.5	ALL	P	SUR	2	0	0	0.9	-6.1	6.2
48557	20.3	-61.2	ALL	P	SUR	1	0	0	0.0	-0.3	0.3
52763	47.5	-2.4	ALL	P	SUR	1	0	0	0.0	-1.2	1.2
62501	32.3	-23.2	ALL	P	SUR	893	0	0	0.6	0.2	0.7
62503	30.9	-16.6	ALL	P	SUR	912	1	0	0.7	-0.4	0.8
62504	36.9	-21.2	ALL	P	SUR	903	0	0	0.7	-0.1	0.8
62512	44.0	-19.5	ALL	P	SUR	944	6	1	1.9	0.0	1.9
62516	48.1	-17.1	ALL	P	SUR	940	5	1	1.6	0.1	1.6
62518	39.2	-15.2	ALL	P	SUR	998	0	0	1.2	0.0	1.2
62519	45.1	-15.6	ALL	P	SUR	426	1	0	0.7	0.1	0.7
62520	58.5	-17.9	ALL	P	SUR	798	1	0	1.3	0.0	1.3
62558	42.9	-15.8	ALL	P	SUR	1	1	100			
62597	50.8	-27.8	ALL	P	SUR	1	0	0	0.0	-0.9	0.9
62598	59.1	-16.5	ALL	P	SUR	469	4	1	1.4	-0.6	1.5
62656	49.7	-23.5	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
62694	54.3	-29.6	ALL	P	SUR	528	1	0	2.1	0.3	2.1
62695	54.5	-23.9	ALL	P	SUR	529	2	0	1.0	0.0	1.0
62696	49.7	-23.6	ALL	P	SUR	519	3	1	1.5	0.6	1.6
62697	50.5	-29.0	ALL	P	SUR	459	8	2	2.7	0.1	2.7
62703	49.9	-2.9	ALL	P	SUR	2	0	0	1.2	0.3	1.2
62707	33.9	-5.3	ALL	P	SUR	3	0	0	6.8	4.0	7.9
62708	53.4	-19.4	ALL	P	SUR	3	0	0	0.5	-0.7	0.9
62726	53.8	-3.6	ALL	P	SUR	1	0	0	0.0	-0.4	0.4
62743	60.3	-4.2	ALL	P	SUR	1	0	0	0.0	1.4	1.4
62763	47.5	-8.4	ALL	P	SUR	1	0	0	0.0	-1.0	1.0
62823	51.4	-9.5	ALL	P	SUR	1	0	0	0.0	-1.3	1.3
62829	48.7	-12.4	ALL	P	SUR	1	0	0	0.0	-1.9	1.9
64549	64.4	-36.3	ALL	P	SUR	975	12	1	2.7	-1.1	2.9
64551	61.9	-27.7	ALL	P	SUR	290	4	1	3.5	-3.0	4.6
64552	60.8	-30.5	ALL	P	SUR	682	3	0	1.7	-0.1	1.7
64846	60.7	-5.2	ALL	P	SUR	1	0	0	0.0	-0.1	0.1
64952	60.0	-31.0	ALL	P	SUR	1	0	0	0.0	-2.2	2.2
65581	61.6	-10.5	ALL	P	SUR	464	9	2	1.3	-0.9	1.6
65595	63.7	-12.3	ALL	P	SUR	1524	7	0	1.0	-0.2	1.0
65602	62.5	-5.4	ALL	P	SUR	1850	9	0	1.3	-0.6	1.4
65682	67.2	-5.7	ALL	P	SUR	1	0	0	0.0	7.8	7.8
90554	22.5	-67.6	ALL	P	SUR	1	0	0	0.0	-0.7	0.7
WIND SPEED											
106018	19.5	-83.5	ALL	SPEED	SUR	1	0	0	0.0	5.3	5.3
41523	30.5	-44.7	ALL	SPEED	SUR	35	0	0	4.6	-5.4	7.1
41552	20.1	-48.4	ALL	SPEED	SUR	596	1	0	1.5	-0.6	1.6
41553	20.8	-66.7	ALL	SPEED	SUR	58	20	34	7.4	14.4	16.2
41554	22.1	-68.0	ALL	SPEED	SUR	629	1	0	2.1	0.7	2.2
41556	15.5	-64.8	ALL	SPEED	SUR	604	0	0	1.9	0.6	2.0
41557	19.9	-59.8	ALL	SPEED	SUR	616	0	0	1.6	-0.2	1.6
41559	19.5	-59.1	ALL	SPEED	SUR	596	0	0	1.4	0.4	1.4
41560	16.9	-54.8	ALL	SPEED	SUR	565	0	0	2.0	0.1	2.0
41561	20.0	-53.7	ALL	SPEED	SUR	591	0	0	1.6	-0.4	1.7

IDENTIFIER	LAT.	LONG.	HOUR	ELEM	LEVEL	NOBS	NGE	PGE	SD	BIAS	RMS
WIND SPEED											
41563	16.9	-43.6	ALL	SPEED	SUR	618	0	0	1.6	-0.1	1.6
41645	30.2	-78.0	ALL	SPEED	SUR	803	6	1	2.6	0.7	2.7
41646	27.2	-77.3	ALL	SPEED	SUR	664	19	3	5.8	-0.2	5.9
41647	23.3	-72.7	ALL	SPEED	SUR	627	2	0	2.4	0.6	2.4
41648	26.8	-76.0	ALL	SPEED	SUR	622	2	0	2.8	1.5	3.1
41652	27.2	-64.5	ALL	SPEED	SUR	619	3	0	2.5	0.3	2.5
44729	38.2	-19.3	ALL	SPEED	SUR	1	0	0	0.0	3.5	3.5
44740	43.7	-51.7	ALL	SPEED	SUR	1	0	0	0.0	-0.3	0.3
44771	59.9	-8.3	ALL	SPEED	SUR	1	1	100			
44805	43.2	-69.4	ALL	SPEED	SUR	2	0	0	0.1	1.4	1.4
44825	40.3	-73.2	ALL	SPEED	SUR	1	0	0	0.0	-1.4	1.4
44840	43.7	-51.7	ALL	SPEED	SUR	1	0	0	0.0	-0.2	0.2
44842	42.5	-64.0	ALL	SPEED	SUR	1	0	0	0.0	3.5	3.5
48557	20.3	-61.2	ALL	SPEED	SUR	1	0	0	0.0	-0.1	0.1
62520	58.5	-17.9	ALL	SPEED	SUR	792	0	0	3.7	-0.1	3.7
62703	49.9	-2.9	ALL	SPEED	SUR	3	0	0	2.2	-0.4	2.2
62707	33.9	-5.3	ALL	SPEED	SUR	2	0	0	1.3	-1.0	1.6
62708	53.4	-19.4	ALL	SPEED	SUR	4	0	0	2.0	-1.5	2.6
62743	60.3	-4.2	ALL	SPEED	SUR	1	0	0	0.0	-0.7	0.7
62763	47.5	-8.4	ALL	SPEED	SUR	1	0	0	0.0	-4.0	4.0
62829	48.7	-12.4	ALL	SPEED	SUR	1	0	0	0.0	-1.1	1.1
64846	60.7	-5.2	ALL	SPEED	SUR	1	0	0	0.0	-0.7	0.7
65581	61.6	-10.5	ALL	SPEED	SUR	1	0	0	0.0	7.0	7.0
90554	22.5	-67.6	ALL	SPEED	SUR	1	0	0	0.0	0.7	0.7
WIND DIRECTION											
106018	19.5	-83.5	ALL	DIRN.	SUR	1	0	0	0.0	-2.7	2.7
41552	20.1	-48.4	ALL	DIRN.	SUR	580	1	0	15.6	-3.1	15.9
41553	20.8	-66.7	ALL	DIRN.	SUR	46	20	43	18.2	27.8	33.3
41554	22.1	-68.0	ALL	DIRN.	SUR	478	1	0	16.9	1.9	17.0
41556	15.5	-64.8	ALL	DIRN.	SUR	587	0	0	17.3	0.9	17.3
41557	19.9	-59.8	ALL	DIRN.	SUR	584	0	0	15.1	0.5	15.1
41559	19.5	-59.1	ALL	DIRN.	SUR	574	0	0	12.6	-1.6	12.7
41560	16.9	-54.8	ALL	DIRN.	SUR	564	0	0	11.3	15.3	19.0
41561	20.0	-53.7	ALL	DIRN.	SUR	566	0	0	14.4	-3.7	14.9
41563	16.9	-43.6	ALL	DIRN.	SUR	617	0	0	13.7	1.4	13.8
41645	30.2	-78.0	ALL	DIRN.	SUR	488	6	1	15.7	6.6	17.1
41646	27.2	-77.3	ALL	DIRN.	SUR	120	19	16	23.5	-12.8	26.8
41647	23.3	-72.7	ALL	DIRN.	SUR	498	2	0	15.7	-2.7	15.9
41648	26.8	-76.0	ALL	DIRN.	SUR	308	2	1	17.3	11.3	20.7
41652	27.2	-64.5	ALL	DIRN.	SUR	276	3	1	23.0	-7.4	24.2
44740	43.7	-51.7	ALL	DIRN.	SUR	1	0	0	0.0	-1.2	1.2
44771	59.9	-8.3	ALL	DIRN.	SUR	1	1	100			
44805	43.2	-69.4	ALL	DIRN.	SUR	2	0	0	7.0	4.1	8.1
44840	43.7	-51.7	ALL	DIRN.	SUR	1	0	0	0.0	-13.2	13.2
44842	42.5	-64.0	ALL	DIRN.	SUR	1	0	0	0.0	-10.6	10.6
48557	20.3	-61.2	ALL	DIRN.	SUR	1	0	0	0.0	10.6	10.6
62520	58.5	-17.9	ALL	DIRN.	SUR	706	0	0	17.4	4.9	18.1
62703	49.9	-2.9	ALL	DIRN.	SUR	2	0	0	1.2	-3.5	3.7
62708	53.4	-19.4	ALL	DIRN.	SUR	4	0	0	16.9	1.0	16.9
62743	60.3	-4.2	ALL	DIRN.	SUR	1	0	0	0.0	32.0	32.0
62763	47.5	-8.4	ALL	DIRN.	SUR	1	0	0	0.0	-6.0	6.0
62829	48.7	-12.4	ALL	DIRN.	SUR	1	0	0	0.0	-14.9	14.9
64846	60.7	-5.2	ALL	DIRN.	SUR	1	0	0	0.0	-14.2	14.2
65581	61.6	-10.5	ALL	DIRN.	SUR	1	0	0	0.0	-62.5	62.5
90554	22.5	-67.6	ALL	DIRN.	SUR	1	0	0	0.0	-2.9	2.9

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures:
Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :40°N - 70°N, 60°W - 0°W.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	801	1	7	2.1	0.1	789	0	5	0	8.3	0.8
ACA	1225	0	3	1.5	-0.3	1249	0	4	0	6.9	0.7
AEA	144	1	5	2.0	0.2	143	0	6	0	9.5	1.0
AEL	312	0	10	1.9	-0.6	316	0	11	0	8.2	0.6
AEY	72	3	6	2.0	1.5	73	1	7	0	7.8	1.1
AFL	431	0	5	1.8	0.5	430	0	5	0	8.1	0.5
AFR	879	1	9	1.8	0.2	892	0	9	0	8.0	0.6
AIH	174	0	2	1.7	-0.2	173	0	4	0	7.2	1.5
AJM	113	0	3	1.6	0.2	116	0	3	0	7.2	2.5
AMM	58	0	10	1.6	0.4	60	0	18	0	15.1	-1.4
AMX	181	1	5	2.1	0.1	179	1	8	0	11.9	0.8
AZA	407	3	12	2.7	0.7	406	0	4	0	8.3	0.9
BAL	142	0	15	1.9	-0.2	142	0	17	0	8.9	0.9
BAW	534	0	10	2.1	-0.9	542	0	10	0	7.2	0.4
BWA	58	0	3	2.0	1.6	60	0	7	0	8.8	0.4
CFG	393	1	3	1.6	-0.6	393	1	4	0	7.8	0.8
CLX	242	0	1	1.7	-0.5	246	0	0	0	6.4	-0.2
COA	98	0	3	1.7	-0.2	99	1	6	0	10.0	0.5
CRL	327	1	4	1.5	0.5	340	0	6	0	9.3	1.1
CUB	108	0	3	2.2	1.2	108	0	3	0	9.0	1.8
DAL	700	1	14	1.7	-0.5	721	0	14	0	8.1	0.8
DCE	105	2	10	1.6	0.6	106	0	13	0	8.3	0.6
DLH	1003	0	10	1.7	0.0	1004	0	10	0	6.9	0.7
EDW	45	0	2	2.0	-0.1	45	0	0	0	5.9	1.1
EEZ	53	2	11	1.7	1.0	53	0	15	0	9.0	0.9
EIA	218	0	6	1.8	-0.3	229	0	100	0	20.1	7.5
ELY	108	0	0	1.4	-0.4	111	0	1	0	5.9	1.0
EWW	136	0	4	1.6	-0.1	139	0	4	0	8.8	2.1
FDX	811	1	32	1.6	0.0	831	0	34	0	8.2	0.9
FIN	254	0	4	1.7	0.0	246	0	5	0	7.5	0.8
GCO	138	1	11	2.0	0.0	144	1	100	0	17.6	3.6
GRL	31	0	0	1.5	-0.4	31	0	0	0	6.4	0.5
GTI	190	2	9	1.9	-0.3	195	1	12	0	9.1	1.5
IBE	961	0	8	2.0	0.3	965	1	8	0	8.4	1.1
ICE	710	0	4	1.6	-0.3	702	0	5	0	6.7	0.5
IRL	34	0	6	2.0	1.3	36	0	8	0	8.2	-0.5
JKK	30	0	7	1.0	-0.1	26	0	12	0	12.7	0.5
JMC	27	0	4	1.8	0.3	28	0	7	0	10.2	-0.8
KLM	1227	0	5	1.9	0.0	1243	0	6	0	8.2	0.5
LDA	59	0	5	1.2	0.3	61	0	8	0	9.3	1.0
LDI	326	2	61	4.1	1.1	331	0	5	0	9.1	0.5
LIB	402	0	12	1.8	0.8	418	0	12	0	9.0	1.7
LOT	112	2	9	1.9	-0.9	115	2	9	0	7.7	-0.1
LTU	489	0	6	1.6	-0.2	490	0	8	0	8.4	0.9
MON	69	0	1	1.9	-0.1	70	0	0	0	5.0	-0.2
MPD	77	3	6	1.7	-0.4	76	0	5	0	10.1	1.2
MPH	393	0	2	1.9	-0.9	403	0	2	0	7.3	0.3
NCA	28	0	0	2.0	0.8	28	0	7	0	7.5	1.0
NWA	2797	0	2	1.6	0.3	2831	0	2	0	6.7	0.4
PAC	98	0	2	2.0	-0.1	99	0	3	0	6.9	0.8
RAM	34	3	18	2.6	-1.3	34	0	15	0	12.2	0.1
RCH	236	1	100	2.1	-0.2	243	0	100	0	17.0	2.8
RJA	26	0	4	2.1	-0.5	25	0	4	0	7.0	1.4
RRR	25	4	16	2.0	-0.2	25	0	12	0	11.4	-2.9
RZO	43	0	51	3.4	1.0	43	0	0	0	8.1	1.7
SLR	131	1	9	1.6	0.5	140	1	11	0	8.5	0.5
SVA	31	0	0	1.4	-0.4	32	0	3	0	7.2	0.6
TAP	295	0	7	1.7	-0.3	295	2	10	0	9.4	1.7
TPA	29	0	0	1.0	0.4	29	0	0	0	6.5	-0.6

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
TSC	31	0	0	1.4	-0.2	31	0	0	0	5.6	-0.3
UAL	306	1	100	1.9	-0.8	322	0	100	0	9.1	0.2
UPS	1063	1	40	1.7	-0.1	1058	0	40	0	8.5	0.2
USA	173	1	1	1.7	-0.2	147	0	3	0	8.5	0.2
VIR	443	0	3	1.6	-0.1	452	0	4	0	7.8	0.7
VKG	29	0	3	1.8	-1.1	29	0	0	0	5.0	0.8
VPB	34	0	0	1.5	0.8	33	0	3	0	8.6	1.1
WOA	87	0	5	1.7	0.3	86	0	14	0	11.9	1.6
EU	23410	0	26	1.4	0.1	23410	0	23	0	5.0	0.5
KL	910	0	8	1.4	0.8	912	0	8	0	6.3	0.8
LH	651	0	8	1.5	0.5	651	0	8	0	5.7	1.1
TN	58	2	5	1.7	0.8	58	0	5	0	7.6	0.5
N	240	1	4	2.2	0.1	240	0	3	0	6.9	1.0
US ACARS	21910	12	37	1.4	0.2	21910	0	27	0	5.8	0.7

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	21	0	14.9	21.6	15.7
ELML7	12	Z	100	23	0	18.8	36.8	31.7
FNOR	00	Z	100	13	0	13.6	34.6	31.8
FNOR	12	Z	100	15	0	9.8	34.6	33.2
FNOU	00	Z	100	8	0	13.9	31.4	28.1
FNOU	12	Z	100	10	0	13.7	25.8	21.8
FNPH	00	Z	100	3	0	10.5	29.3	27.3
FNPH	12	Z	100	2	0	1.5	33.5	33.5
FNRS	00	Z	100	4	0	1.2	28.0	28.0
FNRS	12	Z	100	6	0	16.5	29.3	24.2
LDWR	00	Z	100	29	0	11.6	23.1	-20.0
LDWR	12	Z	100	29	0	10.4	19.4	-16.4
OVYA2	00	Z	100	7	0	31.9	33.1	-8.7
OVYA2	12	Z	100	7	0	15.8	29.4	-24.9
OXTS2	00	Z	100	2	0	10.0	10.0	-1.0
OXTS2	12	Z	100	4	0	17.0	27.6	-21.8
OXYH2	00	Z	100	1	0	0.0	15.0	-15.0
OXYH2	12	Z	100	2	0	1.0	8.1	-8.0
V2XO	00	Z	100	2	0	11.0	11.0	-1.0
V2XO	12	Z	100	1	0	0.0	37.0	-37.0
WPKD	00	Z	100	2	0	17.0	17.1	-2.0
WPKD	12	Z	100	2	0	32.0	47.4	35.0
ZCBP6	00	Z	100	4	0	8.7	9.6	-4.0
ZCBP6	12	Z	100	6	0	15.3	16.2	-5.5
03953	00	Z	100	29	0	13.7	20.8	15.7
03953	12	Z	100	29	0	14.3	24.1	19.4
04018	00	Z	100	29	0	11.5	11.5	0.7
04018	12	Z	100	29	0	21.7	21.7	1.1
04220	00	Z	100	29	0	9.8	15.4	-11.9
04220	12	Z	100	29	0	12.0	20.6	-16.8
04270	00	Z	100	27	0	10.0	17.0	-13.8
04270	12	Z	100	28	0	11.6	22.6	-19.4
04339	00	Z	100	30	0	20.5	24.6	-13.6
04339	12	Z	100	29	0	12.5	15.7	-9.5
04360	00	Z	100	28	0	8.3	13.6	-10.8
04360	12	Z	100	29	0	18.8	28.6	-21.6
08001	00	Z	100	28	0	21.3	23.5	-9.9
08001	12	Z	100	26	0	25.8	26.7	-6.7
08508	00	Z	100	29	0	16.9	18.7	8.1
08508	12	Z	100	27	0	16.5	29.4	24.4
08522	00	Z	100	30	0	11.7	24.7	21.8
08522	12	Z	100	30	0	14.3	30.4	26.8
08594	12	Z	100	18	0	20.9	46.9	41.9
60020	00	Z	100	27	0	12.8	29.3	26.3
60020	12	Z	100	25	0	17.8	29.7	23.8
71600	00	Z	100	30	0	15.3	23.2	-17.4
71600	12	Z	100	30	0	15.0	22.5	-16.8
72201	00	Z	100	29	0	22.4	40.3	33.5
72201	12	Z	100	29	0	27.2	41.5	31.3
72402	00	Z	100	30	0	17.9	29.7	23.7
72402	12	Z	100	30	0	15.4	22.9	17.0
74494	00	Z	100	28	0	14.5	17.8	10.4
74494	12	Z	100	28	0	15.2	19.5	-12.3
78016	12	Z	100	28	0	17.9	27.3	20.7

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

```
 WMO   OBS                NUM    NUM
IDENT TIME ELM   LEV      OBS   GROSS      SD     RMS    BIAS

BNOR    00   Z    500       1      0      0.0     3.0    -3.0
ELML7   00   Z    500      23      1      5.7     5.9    -1.3
ELML7   12   Z    500      25      0      7.6     8.8     4.4
FNOR    00   Z    500      14      0      7.5    11.0     8.1
FNOR    12   Z    500      16      0      9.6    17.0    14.0

FNOU    00   Z    500      10      0      7.0    11.3     8.9
FNOU    12   Z    500      12      0      8.1    12.9    10.0
FNPH    00   Z    500       4      0      5.3     7.6     5.5
FNPH    12   Z    500       2      0      1.5     8.6     8.5
FNRS    00   Z    500       6      0      5.3     6.1     3.0

FNRS    12   Z    500       8      0      5.1    11.7    10.5
LDWR    00   Z    500      30      0     12.3    13.8    -6.2
LDWR    12   Z    500      29      0     10.1    10.2    -1.6
OVYA2   00   Z    500       7      0     40.1    40.5     5.6
OVYA2   12   Z    500       7      0      7.5    10.2    -6.9

OXTS2   00   Z    500       3      0     13.9    14.0    -1.7
OXTS2   12   Z    500       5      0     17.2    18.9     7.8
OXYH2   00   Z    500       1      0      0.0    14.0    14.0
OXYH2   12   Z    500       2      0      5.0     6.4     4.0
V2XO    00   Z    500       2      0      6.0    10.8    -9.0

V2XO    12   Z    500       1      0      0.0     7.0    -7.0
WPKD    00   Z    500       3      0     33.5    35.5    11.7
WPKD    12   Z    500       2      0     43.5    60.8    42.5
ZCBP6   00   Z    500       4      0      2.4     3.2    -2.0
ZCBP6   12   Z    500       6      0      5.7     7.7    -5.2

03953   00   Z    500      30      0      7.8    11.3     8.2
03953   12   Z    500      29      0     10.5    15.5    11.3
04018   00   Z    500      30      0      8.3     9.5     4.6
04018   12   Z    500      29      0     17.0    17.7     4.8
04220   00   Z    500      30      0      9.0     9.8     3.9

04220   12   Z    500      29      0      6.9     7.2    -2.2
04270   00   Z    500      28      0      9.1     9.2     1.3
04270   12   Z    500      28      0     13.6    13.6    -0.9
04339   00   Z    500      30      0     15.8    15.9     1.3
04339   12   Z    500      29      1      9.5    10.7     4.9

04360   00   Z    500      28      0      7.6     7.9     2.1
04360   12   Z    500      30      0      8.3    10.9    -7.0
08001   00   Z    500      29      0     13.6    13.7    -2.0
08001   12   Z    500      28      0     14.5    14.6     1.6
08508   00   Z    500      30      0     14.0    14.2    -1.8

08508   12   Z    500      28      0     15.0    15.2     2.5
08522   00   Z    500      30      0      7.3    11.5     8.9
08522   12   Z    500      30      0      8.2    14.5    11.9
08594   12   Z    500      24      0      9.2     9.4     2.2
60020   00   Z    500      28      0      6.3    12.2    10.5

60020   12   Z    500      27      0      8.4    16.1    13.8
71600   00   Z    500      30      0      9.4    14.9   -11.5
71600   12   Z    500      30      0     10.0    12.7    -7.9
72201   00   Z    500      30      0      6.0    12.3    10.7
72201   12   Z    500      29      0      6.7     8.9     5.9

72402   00   Z    500      30      0      9.0    10.4     5.2
72402   12   Z    500      30      0     10.9    11.0     1.4
74494   00   Z    500      28      0      8.8     8.8     0.1
74494   12   Z    500      30      0      5.6     5.6    -0.5
78016   12   Z    500      29      0      6.7    10.6     8.3
```

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	21	0	0	6.8	-0.2	-0.6
ELML7	12	V	100	23	0	0	5.9	1.2	0.8
FNOR	00	V	100	13	0	0	3.6	1.5	-0.6
FNOR	12	V	100	10	0	0	5.4	0.7	0.4
FNOU	00	V	100	9	0	0	7.1	-0.2	1.4
FNOU	12	V	100	9	0	0	4.4	1.9	2.0
FNPH	00	V	100	2	0	0	11.8	3.9	-7.5
FNPH	12	V	100	2	0	0	2.9	-1.8	0.6
FNRS	00	V	100	2	0	0	2.8	-0.4	0.1
FNRS	12	V	100	5	0	0	2.8	0.9	1.1
LDWR	00	V	100	29	0	0	3.4	0.3	0.0
LDWR	12	V	100	29	0	0	3.0	0.1	-0.9
OVYA2	00	V	100	7	0	0	2.8	1.0	1.3
OVYA2	12	V	100	7	0	0	4.2	-0.9	-0.3
OXTS2	00	V	100	2	0	0	5.3	2.1	-3.6
OXTS2	12	V	100	3	0	0	9.2	2.2	7.0
OXYH2	00	V	100	1	0	0	4.7	-4.6	1.1
OXYH2	12	V	100	2	0	0	3.9	-2.2	0.2
V2XO	00	V	100	2	0	0	3.7	3.4	-0.4
V2XO	12	V	100	1	0	0	1.0	-0.8	0.6
WPKD	00	V	100	2	0	0	2.4	-1.4	1.8
WPKD	12	V	100	2	0	50	44.8	-32.2	5.6
ZCBP6	00	V	100	3	0	0	4.9	0.3	1.1
ZCBP6	12	V	100	5	0	0	5.1	0.3	1.8
03953	00	V	100	27	0	0	4.8	0.5	0.4
03953	12	V	100	27	0	0	3.9	1.2	1.1
04018	00	V	100	28	0	0	4.3	-0.4	-0.2
04018	12	V	100	29	0	0	4.2	-0.3	-1.2
04220	00	V	100	29	0	0	4.0	1.1	0.4
04220	12	V	100	29	0	0	2.8	0.1	0.3
04270	00	V	100	27	0	3	6.6	-0.2	-0.9
04270	12	V	100	25	0	0	3.0	-0.1	0.5
04339	00	V	100	30	0	3	6.4	1.5	-1.1
04339	12	V	100	29	0	0	3.7	1.2	0.0
04360	00	V	100	28	0	0	3.2	-0.8	-0.3
04360	12	V	100	28	0	0	3.2	0.2	0.8
08001	00	V	100	28	0	0	5.4	1.3	-0.6
08001	12	V	100	24	0	0	5.1	1.2	0.1
08508	00	V	100	15	0	0	4.9	0.2	-0.4
08508	12	V	100	18	0	0	6.3	0.5	1.8
08522	00	V	100	27	0	0	5.5	0.5	1.3
08522	12	V	100	27	0	0	4.5	0.7	-0.2
08594	12	V	100	19	0	47	8.6	0.7	4.3
60020	00	V	100	27	0	0	6.5	0.6	0.0
60020	12	V	100	25	0	0	5.7	0.7	0.5
71600	00	V	100	27	0	0	5.5	1.0	-0.7
71600	12	V	100	28	0	0	5.2	0.7	0.2
72201	00	V	100	29	0	0	4.8	1.5	0.3
72201	12	V	100	29	0	0	4.4	0.3	-0.2
72402	00	V	100	30	0	0	4.7	1.6	-0.2
72402	12	V	100	30	0	0	4.4	1.2	-0.6
74494	00	V	100	21	0	42	4.7	-0.6	0.9
74494	12	V	100	24	0	50	6.2	-2.0	-0.1
78016	12	V	100	27	0	0	8.1	2.0	0.6

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: January 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
BNOR	00	V	500	1	0	0	0.7	0.5	-0.4
ELML7	00	V	500	24	0	0	4.3	-0.1	0.8
ELML7	12	V	500	25	0	0	4.0	-0.6	0.5
FNOR	00	V	500	11	0	0	4.5	0.5	-1.2
FNOR	12	V	500	14	0	0	4.6	-0.2	0.1
FNOU	00	V	500	8	0	0	5.0	0.0	1.9
FNOU	12	V	500	12	0	0	5.3	-0.2	-0.4
FNPH	00	V	500	3	0	0	3.8	1.0	-2.9
FNPH	12	V	500	2	0	0	4.7	-3.0	-3.1
FNRS	00	V	500	1	0	0	1.8	-0.3	-1.8
FNRS	12	V	500	5	0	0	3.3	-1.2	1.1
LDWR	00	V	500	30	0	0	4.0	1.3	0.4
LDWR	12	V	500	29	0	0	4.8	1.1	0.2
OVYA2	00	V	500	7	0	0	4.7	-1.7	0.2
OVYA2	12	V	500	7	0	0	4.6	2.5	1.6
OXTS2	00	V	500	3	0	0	3.5	-2.7	-0.5
OXTS2	12	V	500	4	0	0	7.3	-1.6	-1.6
OXYH2	00	V	500	1	0	0	5.4	-5.0	-2.0
OXYH2	12	V	500	2	0	0	3.9	-2.6	2.6
V2XO	00	V	500	2	0	0	4.5	0.4	0.3
V2XO	12	V	500	1	0	0	3.0	2.9	0.8
WPKD	00	V	500	2	1	0	2.3	0.6	0.6
WPKD	12	V	500	2	0	50	29.1	-18.8	-0.2
ZCBP6	00	V	500	3	0	0	5.7	3.2	2.3
ZCBP6	12	V	500	4	0	0	7.9	-1.8	-0.2
03953	00	V	500	28	0	0	5.8	1.1	0.6
03953	12	V	500	27	0	0	4.3	-0.4	0.0
04018	00	V	500	30	0	0	4.1	0.8	-1.5
04018	12	V	500	29	0	0	5.3	-1.1	-1.1
04220	00	V	500	30	0	0	6.3	0.5	0.3
04220	12	V	500	29	0	0	5.5	1.1	-0.9
04270	00	V	500	28	0	0	4.7	0.4	0.1
04270	12	V	500	25	0	4	6.3	-2.2	-0.4
04339	00	V	500	30	0	3	6.9	-1.0	-0.6
04339	12	V	500	30	0	3	6.4	-0.4	0.1
04360	00	V	500	28	0	0	4.9	0.2	0.1
04360	12	V	500	30	0	0	5.2	-1.3	-0.1
08001	00	V	500	28	0	0	5.0	0.1	0.0
08001	12	V	500	28	0	0	5.1	-0.1	-1.4
08508	00	V	500	18	0	0	6.3	0.2	1.4
08508	12	V	500	18	0	0	6.2	0.6	0.1
08522	00	V	500	30	0	0	4.1	0.0	-0.2
08522	12	V	500	27	0	0	4.8	-0.7	0.1
08594	12	V	500	24	0	54	5.1	0.3	1.2
60020	00	V	500	28	0	0	4.8	0.5	0.0
60020	12	V	500	26	0	0	3.9	-0.2	-1.0
71600	00	V	500	30	0	0	4.8	0.7	0.8
71600	12	V	500	30	0	0	4.5	0.7	0.5
72201	00	V	500	30	0	0	2.9	0.2	-0.1
72201	12	V	500	29	0	0	3.4	0.2	0.7
72402	00	V	500	30	0	0	4.3	1.2	-0.3
72402	12	V	500	30	0	0	4.1	0.8	0.4
74494	00	V	500	28	0	57	4.5	-1.6	-0.9
74494	12	V	500	30	0	53	3.7	-1.5	0.5
78016	12	V	500	29	0	0	4.1	1.8	0.2

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed $m\ s^{-1}$
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45